Effective and efficient Risk Information Management

Environment, structure and development in a Case of Financial institution

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Environment, structure and development in a Case of
Financial institution

Vesa Saarinen
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Tehokas ja vaikuttava riskitiedonhallinta – ympäristö, rakenne ja kehittäminen finanssialan yrityksessä

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Systemaattisen ja kokonaisvaltaisen riskienhallinnan merkitys sekä toteuttaminen ovat olleet kasvussa organisaatioissa viime vuosina. Riskienhallintaprosessin toteuttaminen tuottaa tietoa organisaation riskeistä ja riskitieto kasvaa suhteessa organisaation kokoon ja toimintojen moninaisuuteen. Tilanne muodostaa uuden haasteen siitä, että miten tätä riskitietoa tulisi hallita saavuttaakseen parhaan hyödyn riskienhallintaan panostamisesta.

Tämän opinnäytetyön päätavoitteena oli hahmottaa riskitiedonhallinnan rakennetta sekä kartoittaa vaikuttavan ja tehokkaan riskitiedonhallinnan menestystekijöitä suomalaisessa rahoitusalan yrityksessä. Tutkimusongelmaa lähestyttiin kolmesta eri näkökulmasta. Tietoa kerättiin kirjallisuuskatsauksen avulla riskitiedonhallinnan käsitteen hahmottamiseksi sekä yleisistä riskitiedonhallinnan parhaista käytänteistä. Toisena näkökulmana dokumenttianalyysin avulla tunnistettiin ulkoisia vaatimuksia sekä tutkimusorganisaation riskienhallinnan viitekehystä ja periaatteita riskitiedonhallinnan prosessien kartoittamiseksi. Kolmanneksi riskit omistavilta liiketoimintavastuullisilta kerättiin tietoa haastatteluilla riskitiedonhallinnan nykytilasta ja toteutuksesta heidän näkökulmastaan.

Tutkimustulosten perusteella riskitiedonhallinta tai sen menestystekijät eivät ole olleet erityisesti aikaisemman tutkimuksen kohteena. Kuten tässä työssä aikaisemmassa tutkimuksessa riskitiedonhallinta on tunnistettu integroiduksi osaksi riskienhallintaa. Tutkimustulosten perusteella riskitiedonhallinnan rakennetta ja menestystekijöitä voidaan analysoida myös omana kokonaisuutena. Kohdeorganisaatiossa 1. ulkoinen ja sisäinen toimintaympäristö, 2. riskienhallinnan viitekehys ja periaatteet, 3. riskienhallintaprosessit ja käytännöt sekä 4. riskienhallintaan liittyvä tiedonvaihto tunnistettiin riskitiedonhallinnan rakenteen merkittävimmiksi osa-alueiksi. Lisäksi jokaiselle näistä osa-alueista tunnistettiin vaikuttavaa ja tehokasta riskitiedonhallintaa tukevat menestystekijät.

Tunnistettuihin menestystekijöihin verrattuna kehitysmahdollisuuksia tunnistettiin jokaisella osa-alueella tutkimusorganisaatiossa. Tutkimustulosten perusteella esitetään kolmivaiheista kehitysohjelmaa kohti vaikuttavampaa ja tehokkaampaa riskitiedonhallintaa. Tärkeimpänä kokonaisvaltainen ulkoisten ja sisäisten riskitiedon tarpeiden kartoittaminen ja priorisointi, jonka kanssa samanaikaisesti määritellään riskienhallinnan viitekehys ja periaatteet. Toisena vaiheena on määrittää tarpeisiin perustuvat prosessit ja vastuulliset riskitiedon keräämiseksi sekä hallitsemiseksi sisältäen keskeiset mittarit. Prosessien tulisi perustua riskitiedonhallintaa tehostaviin työvälineisiin. Kolmas vaihe on varmistaa riskitiedonhallinnan jatkuva parantaminen, jonka merkittävänä osana on palautteen kerääminen riskien omistajilta.

Tutkimustulosten nähdään olevan vahvasti sidoksissa organisaation riskienhallinnan kypsyystasoon ja kypsyystason perustuvan merkittävän yritysfuusion jälkeisen uuden yrityksen ikään. Vaikka monia kehitysmahdollisuuksia tunnistettiin, haastatellut liiketoimintavastuulliset pitivät nykytilannetta olosuhteisiin nähden hyvänä. Organisaation nykytilanne tarjoaa myös erinomaisen mahdollisuuden hyödyntää tutkimustuloksia parhaillaan käynnissä olevassa riskienhallinnan viitekehyksen ja periaatteiden määrittely- ja käyttöönottotyössä.

Asiasanat: Riskienhallinta, tiedonhallinta, riskitieto, riskitiedonhallinta, riskienhallinnan viitekehys, riskienhallintaprosessi, kokonaisvaltainen riskienhallinta

Laurea University of Applied Sciences   **Abstract**
Leppävaara-unit
Master's Degree Programme in Enterprise Risk Management

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Effective and efficient Risk Information Management - Environment, structure and development in a Case of Financial institution

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Importance and execution of systematic risk management and processes in organizations has been increasing in past years. Execution of a risk management processes produces information about organizations risks and amount of information grows in correlation with organization size and complexity of operations. This opens a new challenge on how this risk information should be managed to ensure best value from the investment to the risk management.

This Thesis explored structure and success criteria of effective and efficient risk information management in a Case study of Finnish Financial Institution. Research problem was approached from three different angles. Literature review was conducted to collect information regarding global risk information management best practices. Second angle was document analysis to review external obligations and case organization's risk management framework and policies to identify processes regarding risk information management. Thirdly business responsible having risk ownership were interviewed to collect their opinions about current state of risk information management and implementations.

Research results show that concept of risk information management or success criteria have not been particularly target of previous academic research. As in this Thesis in previous research risk information management have been identified as integrated part of risk management. Thesis findings support that risk information management can also be analyzed individually with fundamental element and success criteria. In the case organization 1. External and internal environment, 2. Risk management framework and policies, 3. Risk management processes and practices and 4. Risk management communication and consultation where identified as fundamental elements of risk information management. Additionally success criteria of each fundamental element to support efficient and effective risk information management, is identified in the Thesis.

Compared to risk information management success criteria development opportunities where identified within each fundamental element. Based on the findings three step development program is recommend towards more effective and efficient risk information management. First priority is holistically identify, map and prioritize the external and internal demands regarding risk information and at the same time define framework and policies for risk management. Second step is to build and implement processes with responsible to ensure risk information collection and management with key risk indicators to response to the identified needs. Processes should be supported with efficient tools for information management. Third step is to ensure continuous development including feedback collection from risk owners.

Research results are reflected to be strongly linked with maturity of risk management in organization and maturity to the age of new organization after major merger. Although many development opportunities were identified interviewed stakeholders from business saw overall status to be adequate. Current situation also offers a great opportunity to use and apply the research results when organization's risk management framework and processes are currently renewed and deployed.

Keywords: Risk management, information management, risk information, risk information management, risk management framework, risk management process, enterprise risk management

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1   Introduction

Current field literature and results of previous research (e.g. Fraser & Simkins, 2010, Hopkin, 2010 and Merna & Al-Thani, 2008) together with risk management standards like ISO 31000 and COSO ERM which define globally accepted best practices for risk management emphasize that risk management should be implemented as a process and continuity is a key to productive risk management. Frameworks also underline that risk management should be holistic and risk assessments implemented to all operations of the organization and preferably risk information collected from different perspectives. On the other hand there is shared understanding that high-quality and up to date risk information should always be as part of the decision making.

To achieve these three ambitions at same time requires that risk information produced from risk management process (process e.g. ISO 31000 or Hopkin 2010) is managed according to the objectives. Although agreeing on the ambitions the current knowledge (e.g. Fraser & Simkins, 2010, Hopkin, 2010 and Merna & Al-Thani, 2008) does not go much deeper on what are the key elements for successful risk information management. This opens an interesting question about what is the structure of risk information management and the criteria for the risk information management to achieve these intentions. Thesis is approaching this question in single case of financial institution from the perspective of the needs of that particular entity.

Subject institution has just gone through a merger where parent company has acquired a new company. Merger has been rather large compared to size of parent company and initiated an overall integration project where all corporate processes are going to be reviewed to answer to new strategy. This means that also all corporate risk management processes are redefined which opens also needs for new information. Therefore the timing of the research is excellent and supports the effectiveness of the thesis because research results can be used to support building of the company processes from the very beginning.

When reviewing earlier research and results one has to understand that as a field of academic research risk management is rather young. Especially when considering holistic enterprise risk management (ERM) approach which has been identified to be efficient and effective company risk management structure. There has been some research during 2000s (see e.g. Iyer & co. 2010) which concentrates to adoption of ERM in companies but that not in particular explore risk information management. Line of research about the risk information management in national level was also identified to be rather narrow.

The main objective of thesis is to analyze and understand phenomenon of risk information management of the case company. And as part of the analysis to recognize criteria for effective and efficient risk information management and compare criteria to features of current status of the organization. With these results company's risk management and risk information management processes can be developed to ensure best support for the business objectives.

Phenomenon is approached with exploring environment of regulatory external demands and internal demands with current implementations in practice. Emphasis is also on collecting the information and understanding the point of view of business owners of the organization who have responsibility of operations including profit and loss. These are reviewed with results of previous research and field best practices to gain such an understanding that research questions can be answered and thesis objectives achieved.

1.1 Description of the Case

Company is a Nordic multi-sectorial corporation producing payment related services to banks and other companies. Main services are related to payment card issuing and transaction acquisition and processing of payment cards both domestic and global schemes like Visa and MasterCard. Services also include other business areas like offering electronic signing and electronic invoicing services to companies. Head office is located to Denmark and company has currently operations in Denmark, Norway, Sweden, Estonia and after a latest merger also in Finland. Total of personnel is 2700 employees consisting of payment service and IT professionals.

Year	Operating countries	Personnel	Turnover(m€)
2006	DK	1700	508
2010	DK, NO, SWE, EST	2100	686
2013	DK, NO, SWE, EST, FI	2700	1166

Table 1. Case company figures

Company history goes back to 1968 and last years have been years of growth due mergers of existing partners or competitors in the field (see Table 1). Last change was merger with Finnish payment service provider which caused major changes in organizational structure and internal processes. Mergers and changes in operating environment had been base of a new strategy. Company has published a new strategy which aims to gain the benefits from the mergers with focusing to one system one process thinking throughout the corporate.

Importance of risk information management increases in line with organization growth, because generally need of more structured processes is seen required when complexity and amount of organization's functions and operation is increasing amount of information and stakeholders in process (Chaffey & White 2011 and ISO 31000). From the research point of view it can be seen that changes in operating environment set also a new demands for the risk management and for risk information management.

2 Research problem and selected approach

This chapter presents the research problem and objectives of the Thesis with set research questions. In this chapter also an approach to the research phenomenon is opened together with selected information gathering techniques. The presentation of the approach includes argumentation for selections and description about execution.

Current field literature and results of a previous research (e.g. Fraser & Simkins, 2010, Hopkin, 2010 and Merna & Al-Thani, 2008) together with risk management standards like ISO 31000 and COSO ERM which define globally accepted best practices for risk management emphasize that risk management should be implemented as a process and continuity is a key to productive risk management. Frameworks also underline that risk management should be holistic and risk assessments implemented to all operations of the organization and preferably risk information collected from different perspectives. On the other hand there is shared understanding that high-quality and up to date risk information should always be as part of the decision making.

To achieve these three ambitions at same time requires that risk information produced from risk management process (process e.g. ISO 31000 or Hopkin 2010) is managed according to the objectives. All though agreeing on the ambitions the current knowledge (e.g. Fraser & Simkins, 2010, Hopkin, 2010 and Merna & Al-Thani, 2008) does not go much deeper on what are the key elements for successful risk information management. This opens an interesting question about what is the structure of risk information management and the criteria for the risk information management to achieve these intentions. The thesis is approaching this question in the single case of financial institution from the perspective of the needs of that particular entity.

In all of the mentioned frameworks and processes management of risk information is recognized as important part of the risk management success. One particular principle in ISO 31000 model (2009, 8) is that the framework ensures that information about risk derived from the risk management process is adequately reported and used as a basis for decision making and accountability at all relevant organizational levels. But none of the frameworks or the earlier

research (Iyer, Rogers and Simkins 2010) address more detailed concept of risk information management or its structure with success criteria. This opens an interesting base for this thesis to aim structure risk information management more detailed with success criteria.

In this thesis, compiling presented approaches, risk information is defined as information produced from risk management process (process e.g. ISO 31000 or Hopkin 2010) of company and risk information management defined to be all activities to manage this information according to the company's risk management framework. This is the thesis definition of its key concept risk information management and how it is understood.

At the same time ambition is to understand and structure concept more detailed in this case. Because like with risk management frameworks and processes (e.g. Shortreed 2010, 97-123 and Hopkin 2010, 46-52) also with risk information management structure and implementations are beneficial to tailor to serve individual organization. This forms also Thesis main research question: *What is the structure, implementations and a current state of risk information management?* (see Table 2).

BENEFITS OF THE THESIS	RESEARCH QUESTIONS / PROBLEMS
1. INFORMATION ABOUT STRUCTURE, IMPLEMENTATIONS AND THE CURRENT STATE OF RISK INFORMATION MANAGEMENT **2. INFORMATION ABOUT DEVELOPMENT AREAS OF RISK INFORMATION MANAGEMENT ("***what is good and what needs to be developed***")** - Supports business unit level development - Supports corporate level risk management process definition and development and development - Supports corporate level GRC tool acquirement project	**Main: What is the structure, implementations and a current state of risk information management?** 1. Sub: What are the external and internal demands for the risk information management? 2. Sub: How risk information management is executed as part of risk management process and framework 3. Sub: What are the best practices for risk information management according to the earlier research and field literature

Table 2. Research questions

To be able to answer better to the main research question also sub questions were defined. Based on the review of the research phenomenon following sub research questions were defined to structure the approach:

- What are the external and internal demands for the risk information management?
- How risk information management is executed as part of risk management process and framework
- What are the best practices for risk information management according to the earlier research and field literature

Yin (2009, 26) states that every type of empirical research has a research design. In the most elementary sense, the design is the logical sequence that connects the empirical data to a study's initial research questions and, ultimately to its conclusions. Yin continues with referring to Scwab & Samsloss 1980 that part of the design is the question about what data are relevant, what data to collect and how to analyze the results.

To answer to the research questions concept of risk information management is approached from three different angles. These three angles are: what is currently known, external environment and internal framework and implementations. This three angle approach to the research problem is illustrated in the graphic 1. It demonstrates three angles of information gathering which form a research design and a base for exploring the research problem.
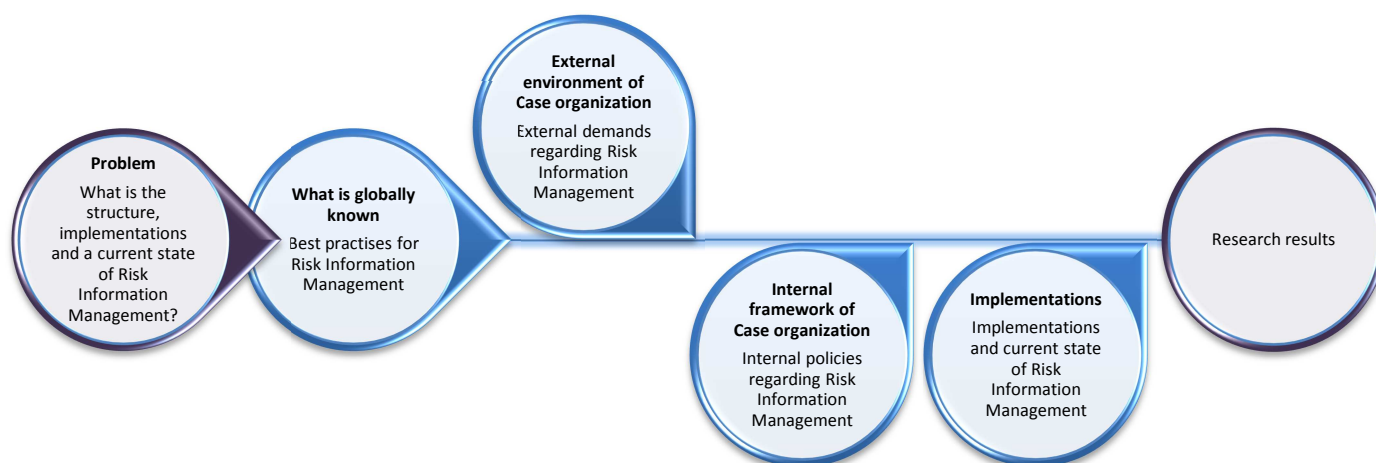
Graphic 1. Approach to the research problem

First angle is the review of earlier academic research with field best practices to understand better how phenomenon of risk information management is approached and what kind of implementations other organizations have constructed. This information is important to structure risk information management in a research case and also to support identification of possible development areas.

Regarding the angle of environment and external demands company is operating in a very regulated and supervised business so this context sets demands also for risk management. Demands consist mainly from laws and especially binding regulation set by Financial Supervisory Authority of Finland (later referred as FSA). Aim is review the environment and external demands to understand better internal structure of risk information management. Area of contractual demands is also identified to belong to this area, but was out-scoped from the review due the fact that currently contractual risk management requirements mainly refer to same FSA standards.

Third and the most important one is the internal angle of the approach. It consist of understanding internal framework of company requirements for risk information management but also going deeper to processes to understand what are the implementations of risk information management in practice and how these implementations support business objectives.

Thesis objectives and quality of research results were guidelines of scoping the approach. Research scope considering the company and business needs is one of its three business units and considering binding norms the legislations of Finland. Scoping is made to support efficiency and quality of a research and still so that results can be analyzed as development base for entire company.

2.1 Research method and implementation

Several research methods like case study, action research and constructive research (Ojasalo & Co. 2009 and Yin 2009) with quantitative and qualitative information collection methods were reviewed to select most appropriate considering the research questions. The aim of the thesis is not to observe general phenomenon of risk information management but to understand it better in one specific company and to collect information about how this certain specific area of the company operations can be developed. Other set fundamental is that also in this particular organization purpose is to deep dive to one specific process not to build generic overview.

Yin (2009, 6) questions common understanding that case studies are only appropriate for the exploratory phase of investigation, that surveys and histories are appropriate for the descriptive phase and that experiments are the only way of doing explanatory or causal inquiries. He (Yin 2009, 8) explores selection of the research method in social science from the point of three conditions (see Table 3). One is the type of research question posed, two is the extent on control an investigator has over actual behavioral events and third is the degree of focus on contemporary as opposed to historical events.

METHOD	(1) Form of the Research question	(2) Requires Control of Behavioral Events	(3) Focuses on Contemporary Events
Experiment	how, why?	yes	yes
Survey	who, what, where, how many, how much?	no	yes
Archival analyses	who, what, where, how many, how much?	no	yes/no
History	how, why?	no	no
Case Study	how, why?	no	yes

Table 3. Relevant situation for Different Research Methods (Cosmos, cited in Yin 2009)

When comparing these conditions to the conditions of the thesis' research problem case study seems to support them best. Yin (2009, 4) describes case study as a relevant research method when objective is to retain the holistic and meaningful characteristics of real-life events – like small group behavior or organizational and managerial processes. Yin sees case study as serving research method the more that research questions require an extensive and detailed description of some social phenomena.

Hirsjärvi & Co. (2004, 125 also Benbasat & Co., 1987) describe case study as a detailed, intensive information about single case or small group of cases in relationship. Ojasalo & Co. (2009, 52) has a same opinion than Hirsjärvi about relevant research method if aim is to observe detailed phenomenon rather than general and they also add case study to be good research method if approach is to develop and produce development proposal and ideas.

Cunningham (1997) differ case studies to three different approach: intensive, comparative and action case study. Each has its own principles and serve different kind of target setting. He describes intensive approach to be used for developing very intensive understanding of the events and practices of one person, group or organization. Comparative approach is based on assumption that a variety of cases can provide a better demonstration of the theory or set of concepts, because they permit replication and extension among individual cases. Action case study is based on action research approach where spectrum of cases is described that focus on research and learning trough intervening and observing the continuous process of change.

Intensive case study approach aligns best with thesis research environment and objectives. Because like Cunningham (1997) states it serves the goal to provide a history, description, or interpretation of unique and typical experiences or events. These events become a basis for developing theory from an understanding of the context in which certain events occurred. All these opinions and experience about intensive case study as a research method support approach and aims of the thesis and with this argumentation intensive case study is selected as research method. Single case approach is used in this thesis as objective is to gain deep and unique understanding of research phenomenon in this individual case, this is supported by the findings of Benbasat & Co. (1987) and Yin (2009).

Cunningham points out (1997) that in intensive case study research setting cannot be controlled so author has to use evidence from different viewpoints and time perspectives. Cunningham (also Yin, 2009) presents narrative data collection approach for intensive case study where qualitative and quantitative information is used to get an answer for specific events. This aligns with the thesis setting where aim is to collect research information from multiple

different sources to understand better the concept of risk information management in this case. These three angles are environment and external demands, field best practices and internal structure and demands. When further studying these areas it was understood that information lies in documentation especially regarding the demands and in people when trying to understand how processes are executed in practice.

This mentioned triangulation (Cunningham 1997), use of multiple research methods, like comparing findings from company policies and theme interviews is set to support validity of research results about the research phenomenon. Yin (2006, 106) and Hirsjärvi & Co. (2004, 197,206) recommend on their experience document analyses and interviews as relevant research information collection techniques for case study. These techniques were in line with the information recourses and so selected as thesis information collection techniques.

Because both external and internal demands are mainly set in documentation like laws, standards and company principles documentation analyses was selected as information collection technique towards that area. To collect general information about risk information management and to explore best practices for risk information management literature review was selected to support documentation analyses (See table x).

To collect information about how processes are working in practice and how risk information supports business objectives information lies in people. It was seen that individuals owning the business and having responsibility about business development would be relevant source of information about risk information management implementations and development needs as they see it. As Hirsjärvi & Co. advice (2004, 197) theme interview as a technique would support information collection from these individuals (see Table 4).

From time perspective implementation of research information gathering was divided to phases.
1. Phase was literature review and documentation analysis
2. Phase was theme interviews

BENEFITS OF THE THESIS	RESEARCH QUESTIONS / PROBLEMS	RESEARCH METHOD AND INFORMATION COLLECTION TECHNIQUES
1. INFORMATION ABOUT STRUCTURE, IMPLEMENTATIONS AND THE CURRENT STATE OF RISK INFORMATION MANAGEMENT **2. INFORMATION ABOUT DEVELOPMENT AREAS OF RISK INFORMATION MANAGEMENT (“***what is good and what needs to be developed***”)** - Supports business unit level development - Supports corporate level risk management process definition and development and development - Supports corporate level GRC tool acquirement project	**Main: What is the structure, implementations and a current state of risk information management?** 1. Sub: What are the external and internal demands for the risk information management? 2. Sub: How risk information management is executed as part of risk management process and framework 3. Sub: What are the best practices for risk information management according to the earlier research and field literature	Case Study A) Literature review and documentation analysis B) Theme interviews

Table 4. Benefits, research questions and information collection techniques

2.2   Literature review and documentation analysis

Aim of the literature review and documentation analyses was to recognize best practices that could support understanding and development of risk information management in case organization and identify internal and external demands that set criteria for risk information management for the company.

Best practices information was explored from earlier research and published articles, field literature and from two generally approved and widely used risk management standards (see Table 5). For detailed review regarding risk information management three publications were chosen. One is Enterprise Risk Management edited by Fraser and Simkins (2010) which collects approximately thirty articles from field world experts. Publication gives a thorough view including results of latest academic research from the area.

To get wider view two other publications that describe and model holistic company risk management were selected for review. One was Paul Hopkins' Fundamentals of Risk management (2010) which is also approved publication of The institute of Risk Management and the other was Tony Merna's and Faisal Al-Thani's second edition from Corporate Risk Management (2008). Besides the publication also three articles exploring the risk information management were reviewed.

Holistic view of best practice information was further fulfilled with exploring thoroughly one of the most globally adopted Risk management standards (according to Shortreed, 2010 Hopkin, 2010 and Ilmonen & CO, 2010) ISO 31000 and COSO ERM. ISO 31000 which is international standard that provides principles and generic guidelines on risk management (ISO 31000, 1). Ilmonen & Co (2010, 33) state that standard has been long prepared and it is first international risk management standard which is applicable to all kind of companies. Standard compiles holistic generally approved risk management vocabulary, framework and process.

According to Moeller (2011, Preface and 14) COSO ERM was developed to give clear definitions to key terms of risk management that dialog between different stakeholders related to risk management would get easier. In the background of framework was especially need of companies that conduct financial and internal audits to have general framework also for risk management. Findings of the literature review are presented in chapter 3 where concept of risk information is further analyzed.

Publication	Published	Origin country	Author
LITERATURE REVIEW: BEST PRACTICES INFORMATION			
Enterprise risk management. Today's Leading Research and Best Practices for Tomorrow's Executives	2010	USA	Fraser & Simkins (editors)
Fundamentals of Risk Management : understanding, evaluating and implementing effective risk management	2010	Great Britain	Hopkin
Corporate Risk Management	2008	Great Britain	Merna & Al-Thani
Article: How Boards of Directors Perceive Risk Management Information	2011	USA	Ballou, Heitger & Stoel
Article: Managing corporate risk trough better knowledge management	2005	USA	Neef
Article: The role of information in risk management, in contemporary economy	2009	Romania	Danu
ISO 31000 Risk management — Principles and guidelines.	2009	Global	International Organization for Standardization
COSO ERM - Enterprise Risk Management - integrated Framework,	2004	USA	Committee of Sponsoring Organizations of the Treadway Commission's

Table 5. Publications selected for the literature review

From external perspective main mandatory documentation are law and standards of Finnish Financial Supervisory Authority (later FSA). Company is currently operating as Payment Institution with license (The Act on Payments Institutions 2010/297) under FSA supervisory and laws and standards that set criteria for Payment institution's risk management was selected for review. All internal company documentation that guides risk management consisting mainly of policies and principles were selected for documentation analysis. Documents are listed in Table 6.

Document	Published	Origin country	Author
DOCUMENT ANALYSIS: EXTERNAL DEMANDS (Mandatory)			
2010/297 The Act on Payment Institutions	2010	Finland	Finnish Financial Supervisory Authority
FIN- FSA Standard 4.1 Internal control arrangements	12/2011	Finland	Finnish Financial Supervisory Authority
FIN-FSA Standard 4.4b Management of operational risk	10/2010	Finland	Finnish Financial Supervisory Authority
DOCUMENT ANALYSIS: INTERNAL POLICIES (Mandatory)			
Description of company management system	06/2011	Finland	Risk Management unit / Approved by Board
Principles of internal control	06/2011	Finland	Risk Management unit / Approved by Board
Principles of operational risk management	06/2011	Finland	Risk Management unit / Approved by Board
Principles of market- and financing risk management	11/2010	Finland	Risk Management unit / Approved by Board
Principles of credit risk management	06/2011	Finland	Risk Management unit / Approved by Board
Credit risk strategy	06/2012	Finland	Risk Management unit / Approved by Board
Principles of fraud risk management	06/2011	Finland	Risk Management unit / Approved by Board
Description of risk management framework	NA	Finland	Risk Management unit
Work instruction: How to process operational risks	03/2012	Finland	Risk Management unit

Table 6. Documentation selected for the document analysis

A documentation analysis was conducted during August and September 2013 by assessing through the documentation to observe risk information management related content. Findings of the documentation analyses are collected to Appendix 1. Findings of the documentation analyses are summarized and reviewed in chapter four where external obligations and internal framework for risk information management are analyzed.

2.3   Theme interviews

Objective of interviews was to collect information from individuals that own the business and are so according to company principles responsible for risk management. Aim was to collect their views about current implementations of risk information management and areas that they see to be in a good level and especially about areas where they see need of development. Theme interview as research method is appropriate when aim is to collect extensively and deeply information about the research phenomenon (Yin 2009, 106-109) so theme interview was selected as interview framework.

Themes were built to support the conversation when overall aim of interviews was thoroughly discuss (as Rubin & Rubin, 2012, advice) around the phenomenon of risk information management to collect information on how interviewees structure it, how they see current company processes regarding risk information management and how well they recognize internal demands of company policies and principles in their work.

Structure of Theme interviews was formed on the findings of the literature review about fundamentals of risk information management. Part of that was to reflect identified global success criteria of risk information management with the opinions of interviewees. Also observations from document analyses of internal company documentation were used to structure more detailed questions.

This base was structured into three themes to support interview discussion. First one was introduction to the risk information management and how interviewees see their own role in a process. Second one was about how individual see risk information management's current status and third theme was about development areas. Under themes more detailed question were inquired to guide the discussion around the research phenomenon. Detailed interview structure is in Appendix 2.

Company's management model is based on processes. Company has main processes and main processes consist of many processes or sub processes. Owner hierarchy of the processes and the business is aligned to process hierarchy which means that business unit leader is the owner of the main process. To collect holistic view individuals from different roles were selected for interview. Interviewees were selected according to process management roles, including owner of the main process (who is also business unit leader with profit & loss responsibility), owner of the sub process (also group leader) and one specialist in role with responsibility to develop one of the sub processes critical to business. Selected individuals also present different roles in risk management process from information collection to risk decision making which is aimed to support holistic information collection regarding research phenomenon.

As Ojasalo & Co (2009, 95-98) advice a lot of effort was put to prepare the interviews to get best result from the interview situation. Individuals were prior the interview informed about the objectives of the research and themes of the interview that they could prepare for the conversation. Like Rubin & Rubin have learned (2012, 85) effort was also put to build trust with interviewees with stating and securing that all interview data is anonymously managed in the research process and report.

Interviews were implemented face to face during September 2013 and two hours was reserved with every interview. To support thorough information gathering interviews were conducted with interviewee's native language Finnish. Interviews were recorded with the permission of interviewees and transcribed. Interview results and findings are analyzed and presented in chapter 6.

2.4   Ambition and benefits of the thesis

Thesis main objective is to gain a good understanding about internal and external environ-
ment and implementations of business unit's risk information management. Also compare
information to the results of previous research and field best practices to understand concept
of risk information management as a whole. Additional objective is with holistic understand-
ing about current status of risk information management to identify the main development
areas to support further improvement (see Table 7).

BENEFITS OF THE THESIS
Thesis ambition is to produce: **1. INFORMATION ABOUT STRUCTURE, IMPLEMENTATIONS AND THE CURRENT STATE OF RISK IN-FORMATION MANAGEMENT** **2. INFORMATION ABOUT DEVELOPMENT AREAS OF RISK INFORMATION MANAGEMENT ("***what is good and what needs to be developed***")** Benefits: - Better understanding of risk information management success criteria to support business unit level development - Better understanding of risk information management success criteria to support corporate level risk management process definition and development - Better understanding of risk information management success criteria to support corporate level GRC tool acquirement project

Table 7. Benefits of the Thesis

Thesis is important for the business unit because results can significantly support develop-
ment of risk information management and the outcomes are beneficial for the company since
outcomes can support corporate risk management and risk information management process
definition. Company has also on-going project of acquisition of Governance-Risk-Compliance
(GRC) software to support management of information on these three areas. Project is col-
lecting requirement specification for the software and results of the thesis can support re-
quirement definition with findings about development areas.

3 Concept of Risk Information Management - RIM

To understand better the phenomenon of risk information management evidence was collected from literature review, document analysis and theme interviews. Main findings of the literature review including results of previous research are summarised in this chapter. Findings are used to further structure examination of risk information management in the Case organization.

Literature review by scope of Table 8. was conducted as part of the research to understand better how risk information management is understood and described in current literature. Background and argumentation to select these sources is more detailed described in Chapter two. Following table also summaries main findings of literature review which are more thoroughly analyzed in this chapter.

Publication	Author, Published, Origin country	Main findings
LITERATURE REVIEW: BEST PRACTICES INFORMATION		
Enterprise risk management. Today's Leading Research and Best Practices for Tomorrow's Executives	Fraser & Simkins(edit.), 2010, USA	1) Framework and process elements in Risk management modeling 2) Examples of tools and practices to support risk information management 3) No structure or success criteria of RIM identified in earlier Academic ERM research till 2010 3) Importance of Key Risk indicators in RIM
Fundamentals of Risk Management: understanding, evaluating and implementing effective risk management	Hopkin, 2010, Great Britain	1) Risk information management seen as part of risk management 2) Importance of roles and responsibilities to support RIM 3) Importance of defined process, practices and tools in risk management and risk information management 4) Examples of tools and practices to support risk information management
Corporate Risk Management	Merna & AL-Thani, 2008, Great Britain	1) Importance of systematic risk information management to support efficiency 2) Importance of risk management development from the point of individual organization 3) Importance on communication and consultation in RIM
Article: How Boards of Directors Perceive Risk Management Information	Ballou, Heitger and Stoel, 2011, USA	1) Overall results suggest that BOD's do not receive sufficient information about RM processes with risk information to be able to understand and evaluate the risks and quality of risk responses 2)Risk information generally includes only short term financial impacts and is not tied to KPI's which would build understanding 3) Portfolio view of risks information supports efficiency and effectives of risk information management
Article: The role of information in risk management, in contemporary economy	Danu, 2009, Romania	1) Circumstances of today's rapidly changing business environment challenges risk information management 2) Due multiple variables and change with every individual organization it is not possible to build one theoretical model for RM/RIM 3) Complexity increases importance of qualitative information gathering and analysis 4) Customers are important source of risk information
Article: Managing corporate risk trough better Knowledge Management	Neef, 2005, USA	1) Knowledge and expertise of employees is vital for RIM (mapping knowledge to asses risk) 2) Indicators and measuring also in field of risk management are important for management 3) Assessment and escalation procedures are important to prevent "information overload"

		4) Tools can structure and support RIM 5) Use of external information is essential for effective risk management
ISO 31000 Risk management — Principles and guidelines.	2009, Global	1) Importance of RM framework regarding risk information management 2) Importance of defined process and techniques regarding RIM 3) Internal and external reporting part of RIM
COSO ERM - Enterprise Risk Management - integrated Framework,	2004, USA	1) Undisputed importance of risk information management as part of framework 2) Importance of risk management framework setup from the point of individual organization 3) Importance on communication and consultation in RIM

Table 8. Summary of literature review findings

When exploring the concept of risk information management it is beneficial to shortly describe risk management and what is the structure and value of risk management according to current understanding. Value of risk management is offer systematic way to manage uncertainties that can affect to organizations objectives.

Fraser and Simkins (2010, 3) referring to Committee of Sponsoring Organizations of the Treadway Commission (COSO) defines risk management as process, effected by an entity's board of directors, management and other personnel, applied in strategy setting and across the enterprise, designed to identify potential events that may affect the entity, and manage risk to be within its risk appetite, to provide reasonable assurance regarding the achievement of entity objectives.

risk management: coordinated activities to direct and control an organization with regard to risk (ISO Guide 73 "Risk Management - Vocabulary" 2009, Geneva)

Moeller exploring before mentioned COSO's enterprise risk management framework (2011, 32) states that risk management should be considered a four step-process: (1) risk identification, (2) quantitative or qualitative assessment of the documented risks, (3) risk prioritization and response planning, and (4) risk monitoring. Continuing that risk management process should be enterprise-wide, involving people at all levels and in all enterprise units.

Merna & Al-Thani (2008, 2) define that the art of risk management is to identify risks specific to an organization and to respond to them in an appropriate way. Risk management is a formal process that enables the identification, assessment, planning and management of risks. They also identify same fundamental as COSO that all levels of an organization need to be included in the management of the risk in order for it to be effective.

Hopkin (2010, 3) states that organizations face a very wide range of risks that can impact the outcome of their operations. The desired overall aim may be stated as a mission or a set of

corporate objectives. He continues that risk management needs to offer an integrated approach to the evaluation, control and monitoring of these risks.

Shortreed (2010, 97) describes that one overarching ISO 31000 risk management model principle is that risk management should have net value to the organization. Risk management should make money, enhance reputation, contribute to the public safety, improve sustainability, generally enhance benefits, and reduce harm. It does this by improving the decision maker's understanding of the effects of uncertainty on objectives, devising risk treatments that are objective-effective, and doing monitoring, review, and improvement of risks and controls.

When outlining the implementation of holistic company risk management there are many outlooks in current literature (compare e.g. Hopkin 2010, 47, ISO 31000, COSO ERM, Merna & Al-Thani 2008, 47, Shortreed 2010, Liebenberg 2011 and Nielson 2005). The views have some variations but also many aligned objectives. One generally emphasized objective is that risk management should have structured framework in company and include dynamic and comprehensive process and that continuity ensures effective and productive results.

3.1 Risk management framework

To support shared ambition of systematic management of risks there are several frameworks presented in current literature. Common viewpoint of frameworks is that those are built to structure and support effectiveness and efficiency of risk management of organization. Few globally most commonly accepted (Hopkin 2010, 54, ISO 31000, COSO ERM, Merna & Al-Thani 2008, 47) are shortly presented here to build understanding of risk management which is understood to be tied to research key concept risk information management.

Risk management framework: set of components that provide the foundations and organizational arrangements for designing, implementing, monitoring reviewing and continually improving risk management throughout the organization (ISO Guide 73 "Risk Management - Vocabulary" 2009, Geneva)

All of the frameworks share an objective that output from the risk management should be thorough up to date image of entities risks that can affect to set objectives. Importance of risk information is undisputed and risk information is seen part of strategic planning and operational management with objective to take risk information into account as part of decision making. This conclusion ties thesis phenomenon risk information management strongly to organization's risk management framework and process.

Shortreed (2010, 97) defines based on the field models that risk management framework include foundations and arrangements for risk management. Further stating that foundations are the policy, objectives, mandate and commitment to manage risk and the arrangements

include plans, resources, processes, relationships, accountabilities and activities. According to them framework should be integrated into the organization's overall strategic and operational policies and practices.

Shortreed (2010, 97) also states that an organization's risk management framework exist only to facilitate risk management process which identifies the associated risks, assesses the risks, treats the risks within an appropriate context, and is supported by risk communication and consultation as well as monitoring and review.

Hopkin (2010, 40, 8) and Merna & Al-Thani (2008, 50) see that structured risk management framework with defined risk management process support company risk management effectiveness. Described continuous process requires risk information management in many layers. They also identify that one critical success factor of risk management is that management should make risk-related decisions using dedicated high quality thorough risk information

As Ilmonen & Co refer (2010, 30) corporate risk management can be structured by generally approved risk management standards and frameworks included to standards. Aim of the standards is cover holistically wide area of risk management. Main benefits of the standards are that they create common language and methods which enable continuity and repeatability approach for risk management.

According to Shortreed (2010, 98 also Hopkin, 2010 and Ilmonen & Co, 2010) one of the most globally adopted Risk management standards currently are ISO 31000 published and produced by International Organization for Standardization (later referred as ISO 31000) and Entrerprise Risk Management framework from Committee of Sponsoring Organizations of the Treadway Commission's (later referred as COSO ERM).

These standards also define framework and processes as main building blocks of successful risk management. Standard describe risk information as important flow of information integrated to the process. ISO 31000 (2009, 7) defines framework to the risk management and the risk management process as in graphic 2 which with some variations is seen also in other referred models.
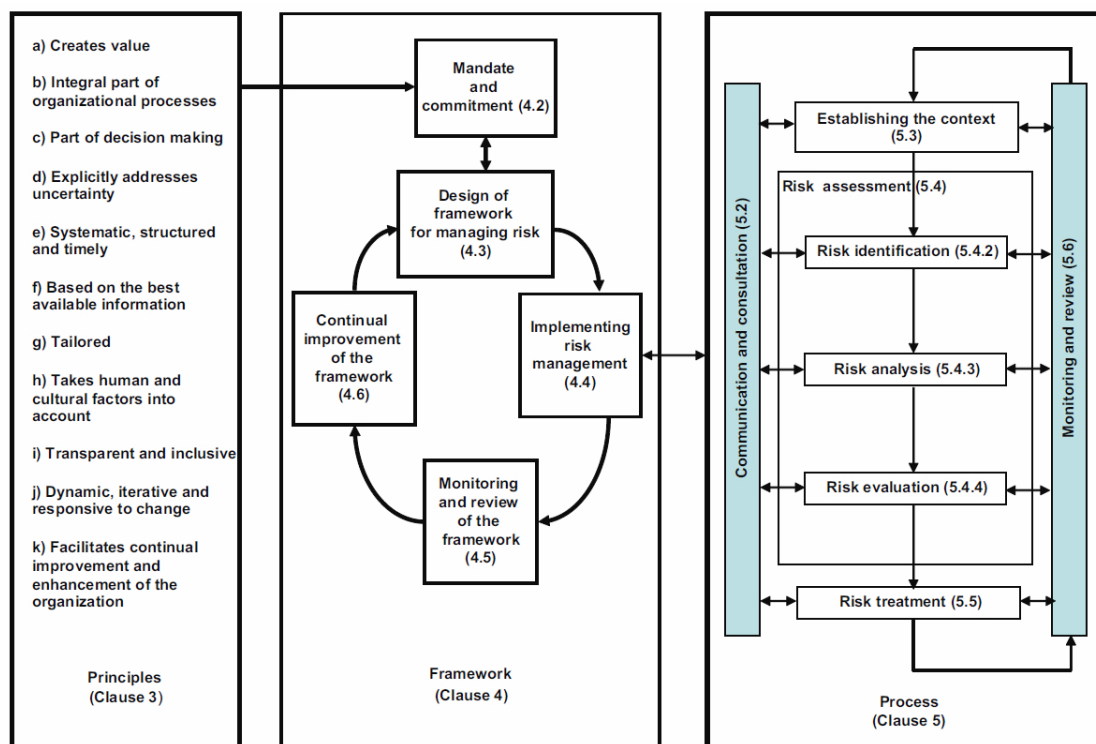
Graphic 2. ISO 31000 risk management framework and process

ISO 31000 (2009,5) standard defines risk management as follows: *"All activities of an organization involve risk. Organizations manage risk by identifying it, analyzing it and then evaluating whether the risk should be modified by risk treatment in order to satisfy their risk criteria. Throughout this process, they communicate and consult with stakeholders and monitor and review the risk and the controls that are modifying the risk in order to ensure that no further risk treatment is required"*

ISO 31000 consist of three elements (see Graphic 2) 1. principles, 2. framework and 3. process. Shortreed (2010, 97) has reviewed the framework and summaries that in definition, the foundations include the policy, objectives, mandate, and commitment to manage risk and the arrangements include plans, resources, processes, relationships, accountabilities, and activities. Shortreed further define by ISO that risk management framework exists only to facilitate the risk management process and that process identifies the associated risks, assesses the risks, treats the risks within an appropriate context, and is supported by risk communication and consultation as well as monitoring and review.

In ISO model risk management process illustrated includes traditional set of risk management tasks to support and assist decision making by any manager anywhere in the organization. Context sets the stage for the decision or activity requiring risk management; risk assessment identifies, analyses, and evaluates the risks; risk treatment enhances the likelihood of posi-

tive consequences and reduces the likelihood of negative consequences to acceptable or tolerable levels; monitoring and review keeps close watch over the risk and the controls implemented to modify the risk; and communication and consultation is continuous to ensure that stakeholders are engaged and contribute to the management of risks. Shortreed (2010, 102)

COSO ERM (Moeller 2011, 55) framework is also three-dimensional like ISO framework. Model is illustrated with cube (see Graphic 3) that have components of four vertical columns that represent the strategic objectives of enterprise risk, eight horizontal rows or risk components and multiple levels of the enterprise, from a "headquarters" entity level to individual subsidiaries. Depending on the enterprise, there can be many "slices" on the model here.

In COSO framework risk management process is formed by eight horizontal elements. It includes objective setting, event Identification, risk assessment, risk response, control activities, information & communication and monitoring. Basically it aligns with ISO process although element of control activities differ and presents model's background from internal audit perspective. Control activities define set controls to ensure that selected risk responses are executed according to risk decisions.
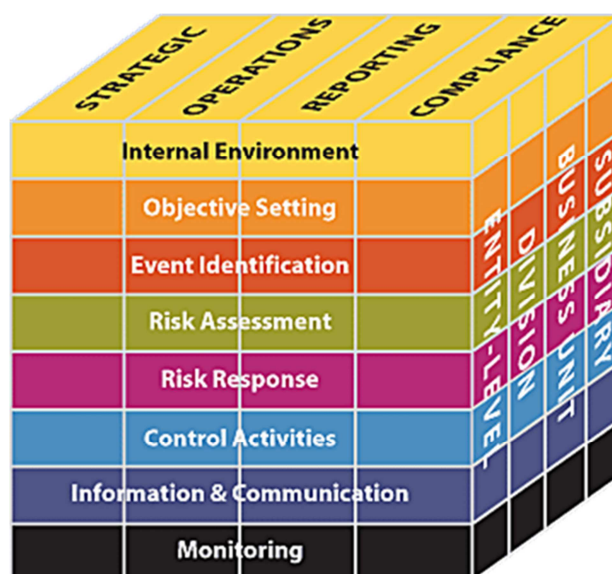
Graphic 3. COSO ERM risk management framework and process

When building fundamentals of risk management also Hopkin (2010, 57) identifies framework as an important fundamental. He reviews also ISO and COSO frameworks and compiles one more general one to explain concept of risk management framework (see Graphic 4). In Hopkin's framework there are four elements: Risk architecture, Risk strategy, Risk protocols and Risk management process.

Hopkin (2010, 55-57) states that it is risk architecture, strategy and protocols that define the framework within which the risk management process takes place. These three are required for successful risk management activities and execution of risk management process. One emphasized element also in Hopkin's framework (framework by Institute of risk management) is that framework needs to facilitate communication and the flow of risk information. In Hopkin's framework roles and responsibilities, risk classification system, risk management process with vocabulary and communication are described key element to support effective and efficient risk information management.
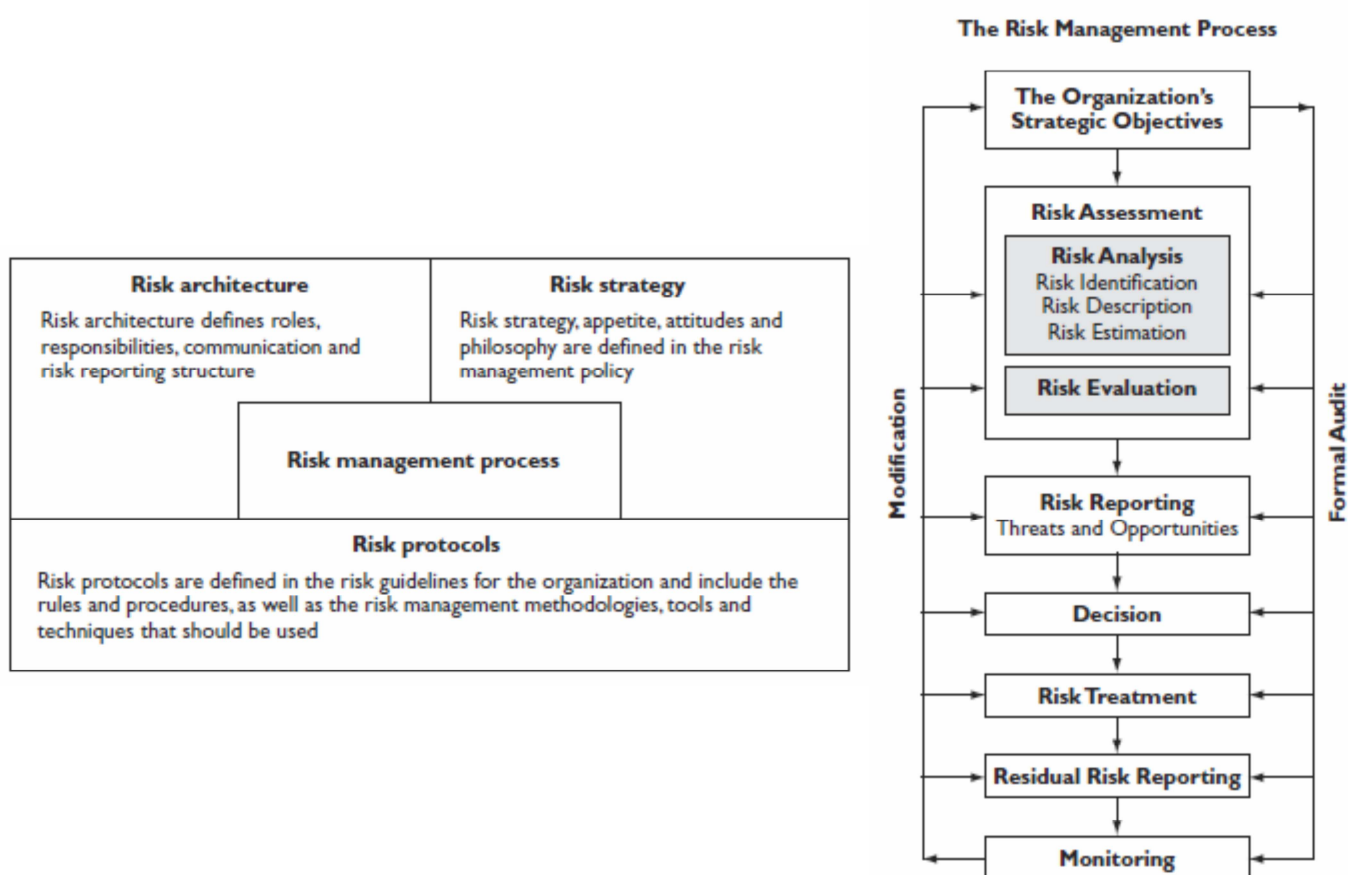
Graphic 4. Hopkin's risk management framework and process by IRM

One important and shared element with frameworks is that they are rather principle based than prescriptive. Frameworks leave latitude to the organization for the specific framework and associated risk management processes. It is emphasized that risk management activities should take place within the context of the business environment, the organization and the risks faced by the organization. Like Hopkin (2010, 57) identifies ISO 31000 places particular emphasis on the context and states that consideration should be given to the internal con-

text, external context, and risk management context when undertaking risk management activities.

3.2   Risk information management as integrated part of risk management

Risk information is identified in all the reviewed frameworks (Shortreed 2010, 109-110 and 119-120, Moeller 2011, 81-83 Hopkin 2010, 100) from two perspectives. One is communication flow across organization about risk management framework and practises that should be strongly executed to support understanding of risk management. Other is communication and consultation of identified risks in risk management process to ensure accuracy of risk information and after that secure information flows to all needed stakeholders. Information flow follows all the process faces and is essential also in monitoring and follow-up phase.

These ambitions demand effective practises when you compare it to Moeller's (2011, 82) illustration (see Graphic 5) of information and communication flows in risk management process or to Hopkin's (2010, 96) example of internal stakeholders of corporation regarding risk management. These illustrations present well the challenge and complexity of risk information management in many organizations and at the same time importance of how risk information management is critical success factor of risk management.
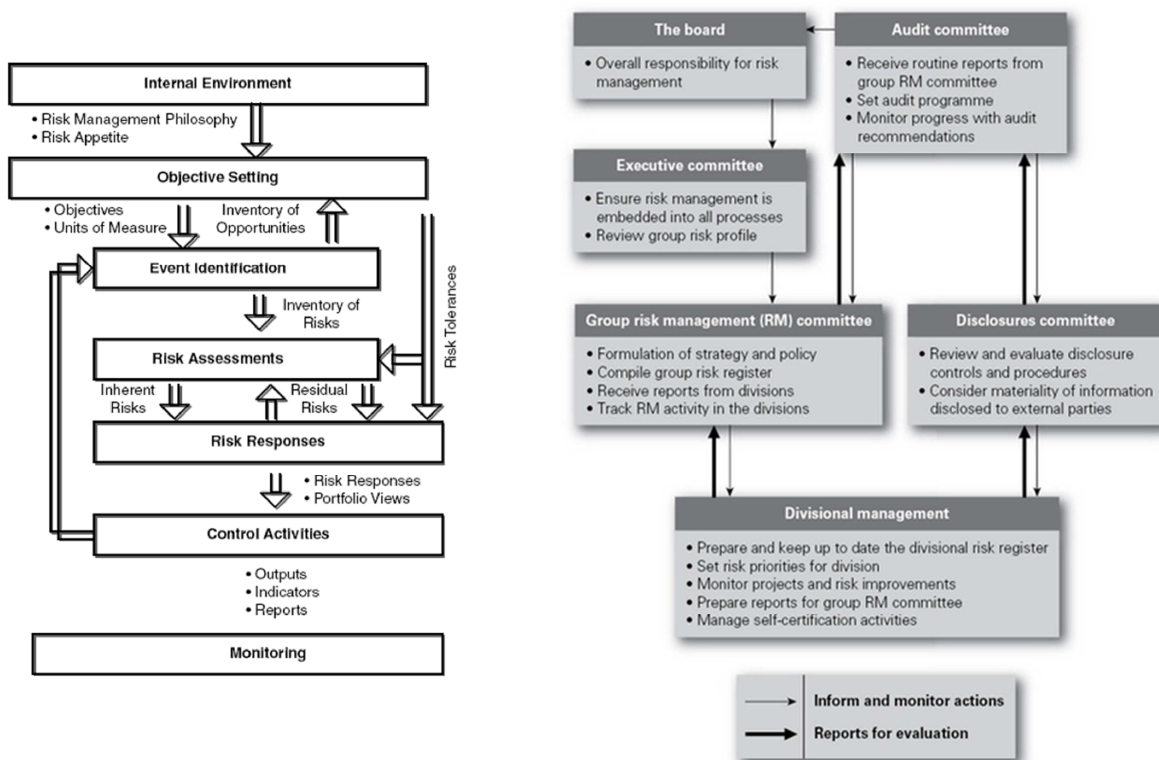
Graphic 5. Risk information and communication flows and RM stakeholders

When exploring previous academic research about risk information management conclusion is that line of specific research is rather narrow. Observation is that review of risk information management has in some occasions been part of research of risk management or Enterprise Risk Management – ERM (see Iyear & Co. 2010). Many of the professionals (like e.g. Beasley & Frigo 2010, 31-50 and Hopkin 225-231) refer to approach of Enterprise Risk Management (ERM) as a holistic solution for risk management that differentiates with taking holistic approach and offering so overall view about risks to the organisations planning and management.

When Iyear & Co. (2010, 419) explored academic research of enterprise risk management till 2010 they identified 10 research studies and 5 case studies. Results of these studies mainly refer to importance on risk information but not specifically explore phenomenon, structure or success factors of risk information management (see Table 9, Iyer & Co. 2010, 419).

Journal/Source	Date	Authors	What Was Examined?	Findings
Risk Management and Insurance Review	1999	Colquitt, Hoyt, and Lee	The objective of the study was to assess the characteristics and extent of integrated risk management.	Survey results obtained from 379 risk managers and was conducted in 1997. Results given on the background and training of risk managers. Political risk, exchange rate risk, and interest rate risk are the three most common non-operational risks handled by the risk management department. Role of risk manager is evolving and covering a wider spectrum of risks.
Risk Management and Insurance Review	2003	Kleffner, Lee, and McGannon	Survey of 118 Canadian Risk and Insurance Management Societies on the impact of the Toronto Stock Exchange (TSE) guidelines on risk management strategy and evolution of risk management discipline	37% of respondents said that TSE guidelines were a driving force behind the ERM decision and 51% said that it was due to encouragement by directors. 61% of respondents said having a risk manager influenced the decision to implement ERM. Factors impeding implementation of ERM were an organizational culture that discouraged ERM, an overall resistance to change, and the lack of qualified personnel to implement ERM
Risk Management and Insurance Review	2003	Liebenberg and Hoyt	Sample consists of U.S. firms that announced appointment of a chief risk officer. Objective to investigate the differences between firms that have appointed CRO and matched sample.	Find there is no systematic difference between firms that signal their use of ERM by the appointment of a CRO and matched sample. Study assumes that the appointment of a chief risk officer also means the company has an ERM process. Large firms and highly leveraged firms are more likely to appoint a CRO.
Internal Auditor	2005a	Beasley, Clune, and Hermanson	Survey of members of Institute of Internal Auditors (IIA) Global Auditing Information Network (GAIN) on internal auditing's involvement in ERM. 90% of the 175 respondents were chief audit executives.	Survey reveals wide diversity in the adoption of ERM and in internal auditing department's role in ERM. There was optimism regarding ERM's impact on the company and on internal auditing.

Journal/Source	Date	Authors	What Was Examined?	Findings
Journal of Accounting and Public Policy	2005b	Beasley, Clune, and Hermanson	Survey responses from 175 members of Global Audit Information Network (GAIN) to investigate factors associated with extent of ERM implementation.	Results show that CRO presence, more independent BOD, explicit calls from CEO or CFO for internal audit involvement in ERM, are positively associated with extent of ERM deployment. Results indicate that U.S. firms are not advanced in their ERM implementations.
Working Paper	2007	Desender	The objective of the study was to explore the link between ERM implementation and board composition. One hundred randomly selected firms from the pharmaceutical industry in 2004 were studied	Results suggest that board independence in isolation has no significant relation with ERM quality. Firms that have separate chairmen and CEOs favor more elaborate ERM and show the highest level of ERM implementation.
Journal of Accounting, Auditing and Finance	2008	Beasley, Pagach, and Warr	Study provides empirical evidence on the value of corporate actions such as the hiring of senior risk executives. The study measures the equity market response to the hiring announcements of senior executives in charge or risk management.	Findings indicate that shareholders of firms with little financial slack welcome ERM. Shareholders of large nonfinancial firms with volatile earnings, greater amounts of intangible assets, low leverage, and low amounts of slack also react positively toward ERM.
Working Paper	2008a	Pagach and Warr	Study explores the link between ERM implementation and characteristics of firms that implement ERM. Appointment of a CRO is used as a proxy for ERM implementation. Data was based on the announcements of the hiring of 138 senior risk officers.	Results show that larger firms and those with higher leverage tend to hire CROs. Firms that have growth options are less likely to hire a CRO and conversely firms that hire CROs tend to have fewer growth options. A negative relation is found between CRO hiring and change in the size of the firm
Working Paper	2008b	Pagach and Warr	Study examines the impact of ERM implementation on financial, asset, and market characteristics. Data was based on the announcements of the hiring of 138 senior risk officers.	Results suggest that there is no support for the position that ERM is value creating. Firms hiring CRO, when compared to non-CRO firms, exhibited increased asset opacity, a decreased market to book ratio, and decreased earnings volatility
Working Paper	2009	Gates, Nicolas, and Walker	Research questions examined include which components of ERM frameworks lead to better decisions and which components of the ERM frameworks lead to increased profitability.	Results show that the ERM stage, a good ERM environment, better communication of ERM missions, and explicit risk tolerance levels, positively influenced better decision making. A better ERM environment, explicit risk tolerance levels along with the number of employees devoted to ERM process appear to have an impact on profitability.

Table 9. Review of Academic research of Enterprise Risk Management

Approaches or results of these studies do not particularly structure or review risk information management. But when exploring further the area few academic articles which touch the research phenomenon where identified. Ballou & co.'s research about How Boards of Directors Perceive Risk Management Information, Neef's study about Managing corporate risk trough

better Knowledge Management and Danu's writing on The role of information in risk management, in contemporary economy.

Ballou, Heitger and Stoel conducted a survey to directors of publicly traded companies to examine the type and quality of risk information they receive from top management. They build their survey on the principles of COSO and NACD to explore how well those are executed and support risk information management in survey companies. Main research question was how board members perceive the nature and extent of the risk information that they receive from management. There were 125 respondents which represent a wide set of business sizes and variety of industries in United States.

Results (Ballou & Co.) of the survey are that few organizations have developed risk-appetite statements of COSO framework that could be used to evaluate risks, boards have limited information about the actual risk management processes like identification, estimation and prioritization of risks that are reported to them and generally that boards are not sufficiently informed regarding key risks and potential responses. Findings also include one particularly interesting point from this thesis perspective that risk impact information is focused on short-term financial   results and does not identify the impact to the potential business drivers (KPIs) which would support wider understanding of risks.

From the Thesis perspective findings suggest that to manage risk information and build sufficient communication and consultation and understanding of risks also processes and practices that are used to identify and asses that particular risk information should be communicated. Another aspect of this is that more complex and many there are processes more recourse is needed to communicate the background with each process in risk information flow.

Neef (2005 also Underdown & Hosseinzadehdastak 2012) studies in his paper the concepts of risk management and knowledge management and how combination of those can support organizations in their risk management efforts. Neef states that companies cannot manage its risk effectively if it cannot manage its knowledge. He builds an example where the reason most often cited when disastrous incidents occur is that senior management had no knowledge of what was taking in place in their company.

His findings include that knowledge is much less effective if left to filter through a management structure in a haphazard way. It needs to be actively managed that employees see concern identification as part of everyday responsibility. This means that company decision makers have to identify and mobilize this huge amount of employee information to support risk management.

Neef (2005) identifies that key to a proactive risk management process lies in the company's ability to mobilize the knowledge and expertise of its employees so that organizational leaders can ensure that they get accurate and timely information about potentially harmful incidents. Regarding the risk information management his suggestion include knowledge mapping, performance monitoring and reporting, community and stakeholder involvement and importance of external information. Knowledge mapping is defined as a database where skills and expertise areas are mapped by employee. This can be used in risk information management to ensure right stakeholders in communication and consultation.

Not many from the found and reviewed frameworks approach risk information management from the angle of information or knowledge management. Exception is article from Danu (2009) which states that information management is actually the key success criteria of overall risk management. This supports the finding that risk information is information like any other information and information management best practises can be used to understand, structure and develop risk information management.

Danu (2009) explores the role of information in risk management in contemporary economy. Her starting argument is that in current global economy system and rapidly changing business environment the available, veridical, complete, appropriate, sufficient information is essential and valences are multiplied. She comes to conclusion that identifying risk to the company is indefinitely more complex and more difficult than one can make a theoretical model.

She (Danu, 2009) reminds that in risk management and risk identification process value and the cost of the information should be permanently viewed because otherwise the operation itself creates the risk. Her finding is that due the complexity of risk in identification phase qualitative methods are more efficient than quantitative methods. She also emphasizes importance of using internal information and assessments before collecting and evaluating external information because internal information builds the contexts for external information evaluation.

Area of information management has a lot longer history than risk management (e.g. English 1999 and Davenport & Prusak 1998). So besides reviewing risk management substance literature research phenomenon was approached from the point of what has been learned and written about information management. Chaffey & White (2011) analyse phenomenon of business information management including questions like information relevancy, accessibility and value. They also state that part of the information management is understanding difference of data, information and knowledge.

Chaffey and White (2011, 18) give a following example about information management (see Graphic 6). They refer to English (1999) stating that *"Knowledge is not just information known, it is information in context. Knowledge is means understanding the significance of the information. Knowledge is the value added to information by people who have the experience and acumen to understand its real potential."*

Graphic 6. The data to information to knowledge transformation process

When exploring area of information management (e.g. Chaffey & White, Honeycutt 2001 and Axson 2007) and comparing information management approaches to risk management frameworks and processes it was understood that approaches align. Both share an objective where data is transferred to knowledge. It was concluded that structures of understanding and developing information management are also valid when analysing risk information management.

When reviewing information management process (see Graphic 7) from the point of risk information management knowledge of organization is essential already in the transformation phase (Neef 2005) although output of the process also in risk information management is more knowledge. This finding means that best practises of information management and knowledge management can be used to structure and develop risk information management.
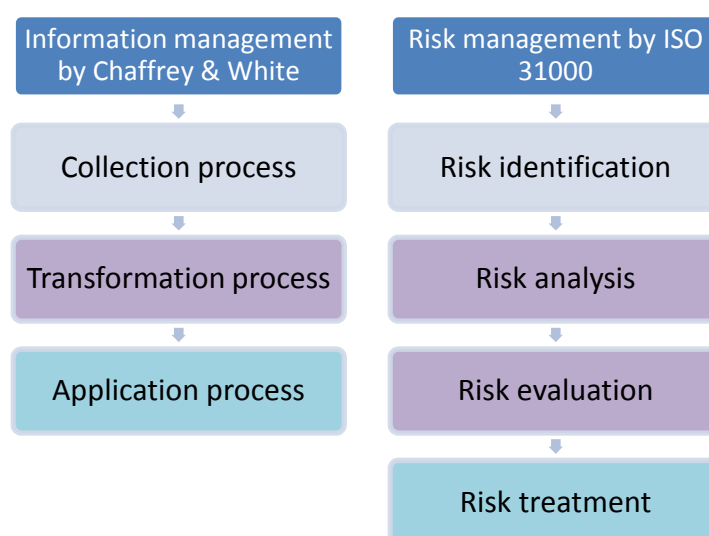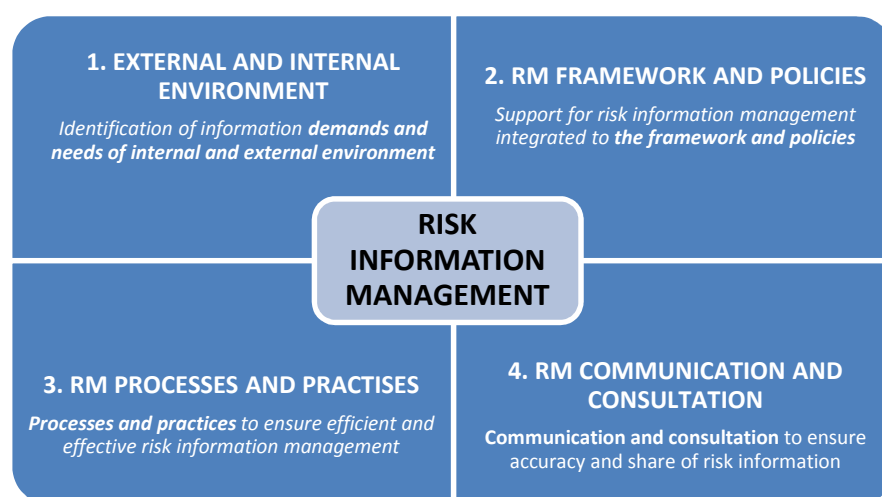

Graphic 7. Information management process compared to risk management process

When exploring structure of risk information management from literature review conclusion is that none of those describe it very detailed or offer structure or success criteria what to use when analysing status of organization's risk information management. This though frameworks are stating that actually the accurate risk information is the overall ambition of risk management in organizations.

Examining further the observations and approaches with learning from information management and knowledge management genres the elements for risk information management can be formed. Conclusions from literature review are that risk information management is strongly tied to risk management and reviewed as part of the risk management in earlier research. Findings support that risk information management is always tied to entities risk management but can also been reviewed as own element with individual success criteria in risk management.

3.3 Identified fundamental elements of RIM

When combining all the findings from literature review to structure risk information management four elements are identified to form a base for the success of risk information management as illustrated in Graphic 8. Identified fundamentals are 1. External and internal environment, 2. Risk management framework and policies, 3. Risk management processes and practices and 4. risk management communication and consultation.

1. EXTERNAL AND INTERNAL ENVIRONMENT
*Identification of information **demands and needs of internal and external environment***

2. RM FRAMEWORK AND POLICIES
*Support for risk information management integrated to **the framework and policies***

RISK INFORMATION MANAGEMENT

3. RM PROCESSES AND PRACTISES
***Processes and practices** to ensure efficient and effective risk information management*

4. RM COMMUNICATION AND CONSULTATION
Communication and consultation to ensure accuracy and share of risk information

Graphic 8. Four fundamentals of Risk Information Management

Risk management approaches identify external and internal environment effecting strongly to structure of risk management of an organization (e.g. Beasley & Frigo, 2010, Brooks 2010). When observing this result from the angle of risk information management it can be identified that environments are also strongly shaping the risk information management.

Cultural, social, political, legal, regulatory, financial, technological, economic, natural and competitive environment, have significant effect also to risk information management. Especially regulatory and customer demands guide external risk reporting that risk information management should support. From the internal environment perspective same areas are affecting to risk information management and especially culture to communication and understanding the risks between internal stakeholders.

Understanding the external and internal and environment is also vital to structure and identify the relevant information sources, stakeholders in information transformation and application. And like Hopkin (2010, 68-75) states risk management should always be integrated part of organizations other processes and management. Because risk information management is seen as integrated part of risk management same applies to it and leads to conclusion that when aiming to structure risk information management understanding of internal and external environment is crucial. Results of previous studies on ERM (Kleiffner & Co. 2003) also support importance of internal environment when implementing risk management.

Hopkin (2010, 67) states that risk architecture, strategy and protocols create risk framework that supports the risk management process. ISO model opened by Shortreed (2010, 97-123) defines that "The framework ensures that information about risk derived from the risk management process is adequately reported and used as a basis for decision making and accountability at all relevant organizational levels."

Risk management framework should also support objective setting, management commitment, roles and responsibilities and identify the processes and practises how organization answers to information needs identified by external and internal framework. This argumentation leads to conclusion that organization's risk management framework sets base also for risk information management and when trying to further explore or understand organization's risk information management, frameworks has to be analysed.

Reviewed literature and research of previous research commonly identify risk management process and used techniques as fundamental part of risk management. In the models processes are generally referred as a systematic way to identify, analyse, evaluate and monitor risks (e.g. ISO 31000 and Hopkin 2010). These processes and practises structure and guide risk information management and were so identified as one of the fundamental elements of risk

information management and area to examine in organization when aiming to structure individual organisation's risk information management.

Example of risk information management fundamentals framework and processes can be identified from Graphic 9 which presents Broadleaf's model on how ISO 31000 framework can be implemented to the organization (Shortreed, broadleaf.com.au). Also individual element of Risk management information System can be seen in their approach as part of practises to support risk information management.
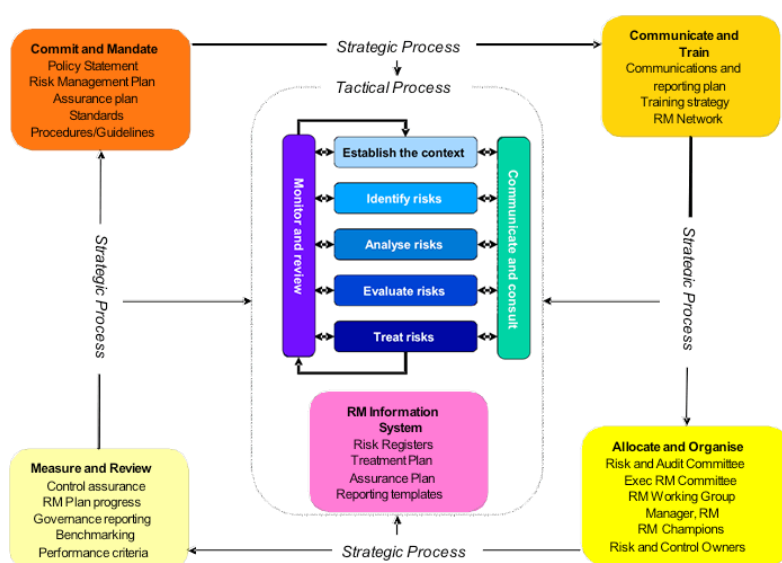

Graphic 9. ISO 31000 implementation by Broadleaf

Findings of the literature review and elements of reviewed approaches underline that in risk management communication and consultation with internal and also with external stakeholders is important element. Value of communication and consultation is to implement organizations risk management approach through the organization and in processes to share risk information for that best available knowledge is used to identify, asses, evaluate and monitor risks.

Core value of communication and consultation is that identified risk information is shared to necessary stakeholders in organization to support decision making. And information additionally used to ensure proper external risk information flows and reporting for example to authorities. With this argumentation communication and consultation was identified to one of fundamental elements of risk information management and its structure.

Identified four fundamental elements that structure success of risk information management can also been illustrated as part of risk management framework. As an example relation of risk information management fundamental to risk management framework of ISO model outlined in Graphic 10. Four fundamentals divide between framework and process element.
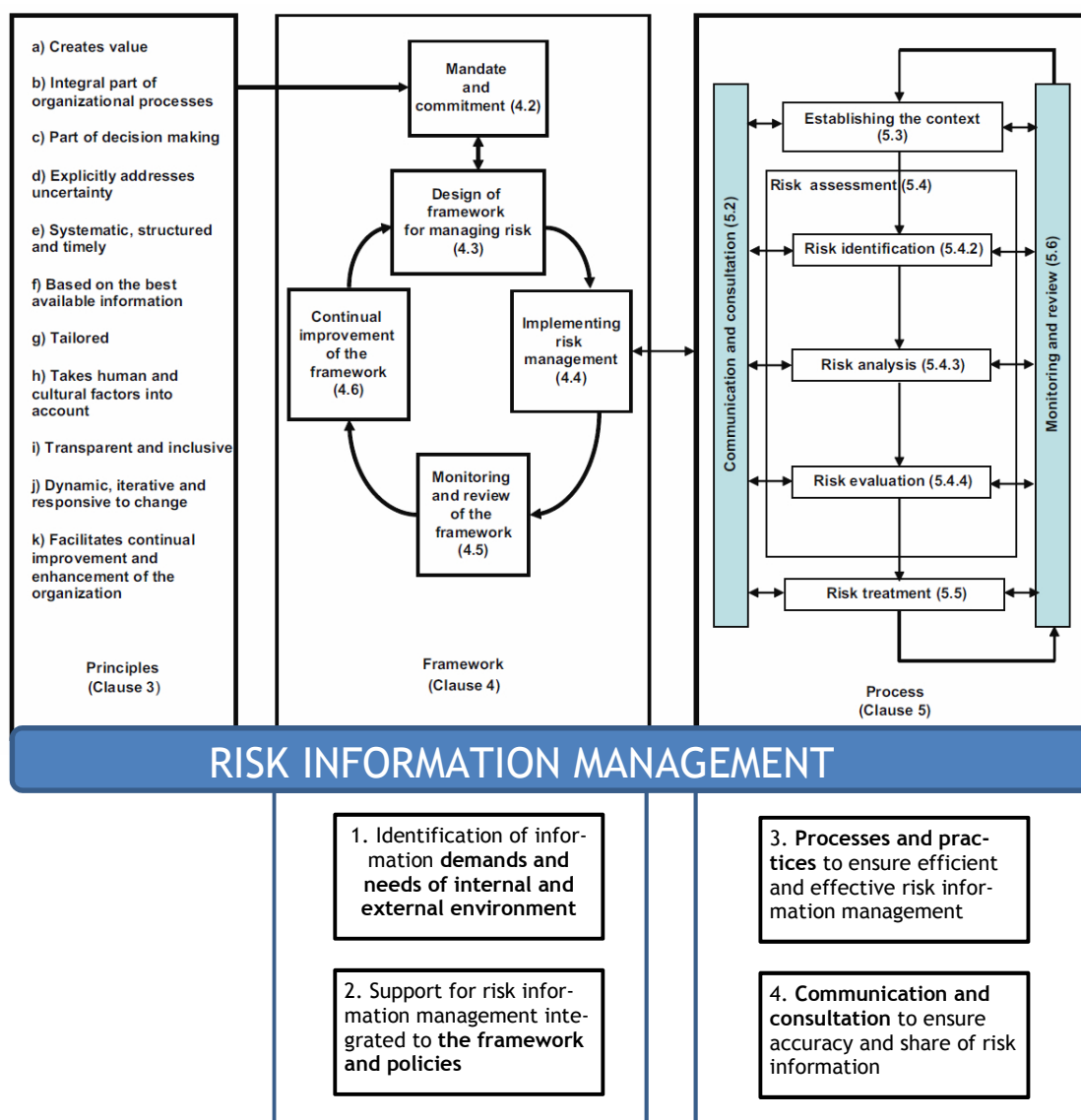
Graphic 10. RIM fundamentals integrated to ISO 31000 framework

Overall conclusions from the literature review are that importance of risk information management is undisputed and emphasized but the structure or learnings to succeed in risk information management were not directly identified. It was identified that phenomenon of risk information management is strongly tied to risk management and reviewed as part of the risk management in earlier research.

Findings support that risk information management is always part of entities risk management but can also been reviewed as own element with individual success criteria. It was also concluded that risk management should always be developed by the need of individual organization so should risk information management.

Four fundamental elements of risk information management where identified to be 1. external and internal environment, 2. Risk management framework and policies, 3. Risk management processes and practices and 4. Risk management communication and consultation. These elements are examined in case organization to further structure success criteria of the risk information management.

4   Findings in the Case regarding environment and framework of RIM

To understand better the phenomenon of risk information management evidence was collected from literature review, document analysis and theme interviews. Findings of the document analysis are summarised in this chapter. Beginning of the chapter is formed by findings from external documentation and d latter part findings from internal company documentation. Findings structure environment and framework of risk information management of case organization.

Considering the companies operating environment and nature of business baseline is high availability of services. Customer demands and service levels of agreements demand 99,99 % availability as standard and that is just license to act but does not differentiate company from competitors. This was also emphasized in the outcome of theme interviews from business owners. Significance of operations to the customers and to the society is the background of strong regulation and supervision from authorities.

When reviewing the external environment first observation is that organization is operating in rather regulated field of business. Organisation is offering payment card services to banks and private companies as Payment institution which is subject to licence from Finnish Supervisory Authority (FSA). Licence ties organization to mandatory regulation which also has mandates regarding risk management which includes mandates regarding risk information management.

Following documentation as in Table 10 was reviewed to understand better the external and internal environment and set obligations for risk management and risk information management. Like often in organizations also in this case company there is dependence between internal and external regulation. Objective of internal regulation is to compile and include the external demands in a way that business owners can ensure fulfilling external demands by

acting according internal regulation. Internal regulation includes naturally also additional
self-guidance decided by board of directors compared to external demands. To understand
better how external demands are interpret to internal regulation was one reason to select
both for review in thesis.

Document	Published	Origin country	Author
DOCUMENT ANALYSIS: EXTERNAL DEMANDS (Mandatory)			
2010/297 The Act on Payment Institutions	2010	Finland	Finnish Financial Supervisory Authority
FIN- FSA Standard 4.1 Internal control arrangements	12/2011	Finland	Finnish Financial Supervisory Authority
FIN-FSA Standard 4.4b Management of operational risk	10/2010	Finland	Finnish Financial Supervisory Authority
DOCUMENT ANALYSIS: INTERNAL DEMANDS (Mandatory)			
Description of company management system	06/2011	Finland	Risk Management unit / Approved by Board
Principles of internal control	06/2011	Finland	Risk Management unit / Approved by Board
Principles of operational risk management	06/2011	Finland	Risk Management unit / Approved by Board
Principles of market- and financing risk management	11/2010	Finland	Risk Management unit / Approved by Board
Principles of credit risk management	06/2011	Finland	Risk Management unit / Approved by Board
Credit risk strategy	06/2012	Finland	Risk Management unit / Approved by Board
Principles of fraud risk management	06/2011	Finland	Risk Management unit / Approved by Board
Description of risk management framework	NA	Finland	Risk Management unit
Work instruction: How to process operational risks	03/2012	Finland	Risk Management unit

Table 10. Documentation selected for the document analysis

4.1   External obligations – Environment

Main binding regulation of payment institutions is the Act on Payment Institutions (2010/297)
and regarding the risk management FSA's standards 4.1 Internal control arrangements and
4.4b Management of operational risk. Also standards 4.4a Management of credit risk, 4.4c
Management of market risk and 4.4d Management of liquidity risk set demands for risk man-
agement and management of risk information. Besides the law from above mentioned stand-
ards two first listed guide strongly risk management framework of supervised entities and
were chosen to more detailed analysis in Thesis. Findings of the document analysis are de-
tailed presented in appendix 1 and main findings regarding the research phenomenon summa-
rized in this chapter.

Document	Published	Origin country	Author
DOCUMENT ANALYSIS: EXTERNAL DEMANDS (Mandatory)			
2010/297 The Act on Payment Institutions	2010	Finland	Finnish Financial Supervisory Authority
FIN- FSA Standard 4.1 Internal control arrangements	12/2011	Finland	Finnish Financial Supervisory Authority
FIN-FSA Standard 4.4b Management of operational risk	10/2010	Finland	Finnish Financial Supervisory Authority

Table 11. Documentation regarding external demands

The Act on Payment Institutions (2010/297 19§) sets high level principle for licence that payment institutions should arrange governance and risk management of operations in a way that risks that can danger its capital adequacy or solvency are identified and avoided. Payment institution has to have governance that ensures efficient risk management, sufficient internal control governance compared to its operations and sufficient risk management systems.

In a law (e.g. 19§ and 39§) mandate is given to FSA to further regulate arrangement of internal control and risk management with FSA standards. The Decree of Payments Institutions (554/2011 14§) which set terms for licence application demands description and assurance of risk management arrangement including arrangement of risk reporting to the executive management of organization, arrangements of information security and business continuity assurance of critical services.

FIN- FSA Standard 4.1 (2003) Internal control arrangements set obligations for arrangements of internal control and as part of that adequate risk management and internal risk information flow. Standard (FIN-FSA 4.1 2003, 16) sets a specific obligation for risk control function which shall maintain, develop and prepare risk management principles for approval by the board of directors and design and develop procedures for controlling risks and risk management. It shall make sure that each risk remains within confirmed limits. It shall also make sure that the procedures available for measuring each risk are appropriate and reliable. The procedures must include assessment of the impact of exceptional situations (stress tests). These obligations to asses each risk with described matter sets demand for internal risk management processes and for down-top risk information flow to risk control function.

Additionally in chapter 5.3.1 of standard (FIN-FSA 4.1 2003, 16) there is demand that the risk control function must ensure that the total effect of all material business risks on the performance of the supervised entity and its consolidation group and on the regulatory capital is reported to the board of directors. The risks are more detailed defined in chapter 6.2. (FIN-FSA 4.1 2003, 19) as all material business risks of the supervised entity: both internal and external, both measurable and non-measurable, both risks controllable by the supervised entity and risks that cannot be controlled, i.e. risks that the supervised entity can only protect

itself against. This means that together with regarding risk information from individual risks also portfolio approach and total effect of identified risks has to be ensured.

In chapter 6.4 (FIN-FSA 4.1 2003, 20) justification for preconditions of effective internal control is given as that the board of directors, CEO and other senior management, as a basis for its decision-making, is provided with adequate and comprehensive information (on operating performance, risks, deviations, observations of effective control etc.).The information shall be reliable, material, timely, and provided in the agreed format. With recommendation to ensure effective internal control, the flow of necessary information should be free upward, downward and laterally throughout the organisation. From this regulatory demand for also downward information flow can be identified as important element as upward flow which sets additional demand for risk information management.

In standard (FIN-FSA 4.1 2003, 21) it is guided that a well-implemented organisational structure supports the upward flow of information so that the board of directors, CEO and other senior management get the information they need. An appropriate downward flow of information ensures that the personnel have knowledge of policies and procedures approved by the board of directors that are necessary for executing their duties, and that they are also provided with other information needed for executing their duties.

In chapter 7 standard (FIN-FSA 4.1 2003, 23) describes reporting demands to FSA as that the internal control arrangements do not involve a separate, regular obligation of reporting to FIN-FSA. However, the supervised entities shall in their financial statements also provide regular information on arrangements for internal control and for the risk management forming an integral part thereof.

The core standard regarding risk management is FIN-FSA Standard 4.4b Management of operational risk (FIN-FSA 4.4 2004) that further guides arrangement of risk management of licence holder. The standard (FIN-FSA 4.4 2004, 13) obligates licence holders to ensure that the board of directors must be able to recognise all key operational risks in the different business areas of the institution. Regular reports on the institution's key operational risks shall be submitted to the board of directors as part of continuous internal control. The responsibility and reporting relationships between business units and other units responsible for operational risk management shall be clear and comprehensive. These obligations set a demand for case organization to have rather structured risk management processes with defined clear roles and responsibilities which support systematic management of risk information.

Chapter 5.3 (FIN-FSA 4.4 2004, 14) defines obligations to identify, assess and mitigate operational risks of organizations operations but also regarding new products before introduction.

Factors of likelihood and possible losses have to be assessed regarding every identified risk. These obligations set necessary elements regarding risk information of organization. Besides identifying the risks binding norms are presented regarding monitoring and reporting of operational risks. Where the supervised entity shall regularly monitor and assess the nature of recognised operational risks, the probability of risk realisations and realisation losses. In addition, proactive procedures and metrics for recognising operational risks shall be created

Chapter 6 ((FIN-FSA 4.4 2004, 19) describes key components of operational risk management emphasizing systematically build processes. Standard demands the supervised entity to include several areas to analyses of operational risks that also guide collection of risk information. Areas specifically addressed in standard are: processes, legal compliance, personnel, continuity of operations, information systems and information security and payment systems and payment services.

Regarding internal risk reporting ((FIN-FSA 4.4 2004, 16) senior management must obtain regular reports on operational risks and realisations. Institutions shall draw up the related reporting instructions. The reports shall comprise financial information, qualitative analyses, assessments of compliance with internal and external instructions as well as information on external events and changes in the operating environment that are relevant for the institution's decision-making. Additionally standard describes element of continually improvement by stating that senior management shall regularly assess the timeliness, precision and appropriateness of procedures and reporting systems. The contents and level of detail of reports as well as their target group and reporting frequency shall also be assessed on a regular basis.

Regarding external FSA-risk reporting standard sets specific reporting demand regarding operational risk events. In chapter 2 (FIN-FSA 4.4 2004, 7) there is binding obligation stating about damage and events related to operational risk shall be reported to FIN-FSA according to the instructions provided in reporting standard RA4.2. Reporting standard further describes examples like immediate reporting of disruptions and faults in operations and substantial mistakes in the publication of the value of fund units.

General conclusion from environment review is that case organization is doing business surrounded by strong availability demand from customers with low risk tolerance or appetite. Describing for the business environment is that services are subject to a license and licence holders are rather strongly regulated and supervised by authorities. Regulation sets strong demands also for arrangement of risk management and management of risk information including internal and external risk reporting.

4.2   Internal obligations - Framework

Other part of the document analyses was the internal binding documentation (see Table 12.). Internal documentation builds the framework for risk management and risk information management and is at the same time response to many of previously mentioned external demands. Target organization is in the middle of a merger which has great effect to current internal governance documentation.

Document	Published	Origin country	Author
DOCUMENT ANALYSIS: INTERNAL DEMANDS (Mandatory)			
Description of company management system	06/2011	Finland	Risk Management unit / Approved by Board
Principles of internal control	06/2011	Finland	Risk Management unit / Approved by Board
Principles of operational risk management	06/2011	Finland	Risk Management unit / Approved by Board
Principles of market- and financing risk management	11/2010	Finland	Risk Management unit / Approved by Board
Principles of credit risk management	06/2011	Finland	Risk Management unit / Approved by Board
Credit risk strategy	06/2012	Finland	Risk Management unit / Approved by Board
Principles of fraud risk management	06/2011	Finland	Risk Management unit / Approved by Board
Description of risk management framework	NA	Finland	Risk Management unit
Work instruction: How to process operational risks	03/2012	Finland	Risk Management unit

Table 12. Documentation regarding internal demands

Management decision is that current policies of both merger companies are the governance model so far that new corporate level binding policies are elaborated and accepted. With this background current documents were seen relevant for the research although development work is on-going. One argument to review current policies is that these are the ones that are guiding current situation which is the base how interviewees understand risk information management practises.

Considering risk management and risk information management *Description of company management system* structures the risk management framework with defining risk management as integrated part of overall management system and defines roles and responsibilities at high level. *Description of risk management framework* state regarding roles and responsibilities that Business unit leader is accountable for operational risk management and process owner for process risk management. BU leader is also responsible for that BU risk information is up to date.

Principles of internal control and *Description of risk management framework* continue with defining in more detail that risks are managed with three level hierarchy, in strategic, tactical and operational level. Framework also defines four level risk classification system for risk information which consist of risk category, risk class, risk name and risk description stating that every identified risk should be classified according to this system. Classification is built to structure risk information, support risk information management and data mining.

Framework defines risk management process and scopes that strategic, process, IT-system and operational risks should be managed according to the process. Framework states that process and IT-system risk assessment has to be conducted at least to all significant processes and IT-systems biannually. Process defines that outcome of assessments has to be documented.

Framework defines numeric scales for risk evaluation with likelihood and consequences which total risk significance. There is one defined for strategic risks and other for operational risks. Part of the defined process is a model for risk escalation and risk decision making. Four level risk decision making model is presented aligned to risk significance and organizations management model. Decision model sets demands   also for reporting and escalation of risks and defines demand to document all risk decisions.

Framework states also the stakeholders that should contribute to risk information collection and to risk assessments regarding operational risks. It is stated that at least process specialists, IT-system owners/specialists and finance department should take part. Process owner is the responsible for executing the process risk assessments and IT-system technical owner responsible for IT-system risk assessments.

As part of the process tools to support risk information collection and assessment are presented in framework and further detail in *Principles of operational risk management* and *Work instruction: How to process operational risks*. There are specific risk registers for operational risks and for development risks. Besides those registers repository for collected risk information is defined. That is a Business unit risk master that should include all the identified operational risks and support monitoring and reporting of risk information.

Principles of Operational risk management define more detailed organization's risk management vocabulary and goes in to more detailed instruction how and what information to collect from single identified risk, how risks should be assessed and risk decisions made in different decision-making layers in process. Out from the general process framework also describes process of anonymous risk identification ("whistle blower practise") and process and responsible for incident reporting to FSA.

Credit risk strategy, Principles of Credit risk management, Principles of fraud risk manage-ment and Development Management Handbook (development risks) align with framework and process but further detail mandates and instructions regarding these specific risk categories. There is stated mandate of monthly reporting to business unit management team about these risk categories which guide also information gathering process on these areas.

In the area of risk information reporting framework defines biannual mandate reports to board of directors which include status of a credit, fraud, market- and finance and operation-al risks. According to the framework development risks has to be reported quarterly.

These reporting mandates also set frequency to the information collection and update pro-cesses. Work instructions define also mandates of monthly risk reporting to Business unit management team, weekly review of incidents in service production week meeting and bian-nual reporting to risk committee. Framework states that reporting to supervising authority is done when demanded.

General conclusion from document analyses is that internal policies respond quite well to identified external demands. When considering the elements of risk information management recognized in chapter 3 with internal documentation regarding risk management many corre-spondences are identified. Internal binding documentation defines framework and as part of that opens responsibilities, process, tools and techniques for which structure and support risk information management.

As part of the theme interview results it is discussed how interviewees identify these policies and see them supporting risk information management in practice. Just by assessing the in-ternal documentation it was observed that many demands, tools and techniques are present-ed but support on how to manage risk information from multiple sources to form holistic up to date risk image were not identified.

Considering identified risk information management ambitions to form holistic picture devel-opment area in framework would be more emphasis on process description and continuous information management. Other development area observation was overlap of areas and part-ly non coherent guidance between different documents.

Main issue, like mentioned in the beginning of the chapter, is documentation's correspond-ence to the current governance model, organization and roles after merger which is vital be-cause there are many deficiencies in current binding internal documentation. Recommended

development step is to update of all existing documentation guiding risk management taking account he observations regarding more efficient and effective risk information management.

5   Findings in the Case regarding processes and communication of RIM

To understand better the phenomenon of risk information management information was col-lected from literature review, document analysis and theme interviews. Main findings of the theme interviews are summarised in this chapter. Findings structure implementations and success criteria for risk information management in the case company.

First theme discussed with interviewees was current framework supporting risk information management and how did they see it in their role. General opinion was that internal binding documentation about framework is not very familiar but current processes and practises were seen in general supporting business development.

When asking that do interviewees see that risk information is collected and managed from right areas senior management representative commented that sometimes it seems that risk information is fragmented to many sources and it would be good to ensure that we are really working with the right issues. Also Hopkin (2010, 45) warns that organizations with mature risk management processes can drift to the situation where there is over-reliance to on in-formation at the expense of good judgement and individuals only comply with requirements without really putting effort to identify and manage risks.

To prevent this situation clear objective setting with reasoning and implementation including active two way development discussions is important. This can be supported with holistic risk portfolio approach and way of thinking that risk information should be collected as part of daily operations not as separate task.

One objective of the risk management framework (see e.g. Hopkin 2010, 54, ISO 31000, COSO ERM, Merna & Al-Thani 2008, 47) is to define roles and responsibilities and when comparing the risk management responsibilities in framework policies and how interviewees saw their role in risk information management results were in line. That supports the observation that although framework policies are not so familiar with the interviewees current practises still aligns with framework in this area.

One identified criteria for effective risk information management is thoroughly acknowledged external and internal demands. When discussing the area respondents felt that internal de-mands are rather well identified and also communicated for example as part of yearly busi-ness planning. External demands were not so clearly recognized and communicated but inter-viewees' understanding was that corporate risk management unit is taking care for example about external reporting based on business unit's risk information and generally also this were

seen working well. From the situation it can be seen that defined documented internal and external demands regarding to risk information management could support holistic development.

Implementation of a framework is fundamental part (Hopkin 2010) when building risk awareness culture of the company. When asking about that has interviewees been trained or informed about company risk management framework all were in line with their answers that at least they do not remember any training or orientation been offered. This is an interesting result as also senior management is represented among interviewees. Respondents recall seen many presentations for information but overall observation from the answers is that there is a development opportunity in this area.

Other identified fundamental of effective and efficient risk management is principle of continuous development (ISO 31000) which aims to critically observe current practises and processes to identify possible development areas. When inquiring about that have respondents been participating in development or have they been asked to give feedback about company risk management processes or practises they did not recall that kind of activity. This is also an interesting observation considering that all of the respondents have been working for the company at least five years and senior management representative over twenty years.

When further discussing about risk management processes defined in the company framework they were familiar to the interviewees and they had been executing processes in their role. Interviewees identified that they have been actively participating to management of strategic and business risks, development risks and operational risks which all have defined individual process. Regarding risk information management each process includes information collection, transformation and application phase and depending on the role of interviewees' emphasis was divided between phases.

One element identified by interviewees regarding risk information management is the importance of monitoring process. If risks are not systematically updated and also non active risks removed from information repositories it leads to the situation where information is not valid and risk view is gets fragmented. Observation from this identification is that clear responsibilities and mandate to follow up and update risk information is beneficial element of risk information management.

Interesting observation regarding the framework was that none of the interviewees saw challenges executing risk management policies after company merger. All though it was observed that many fundamental element like company management model and decision making roles have fundamentally changes in a merger. This observation aligns that in everyday operations

uncertainties are managed still according to old policies using common sense with challenges. Generally that activities are normally executed is supports business but in longer run current situation might cause more challenges to efficient and effective risk management.

Risk information management process is integrated part of company risk management process but it can be analysed also individually to observe how data is transformed to knowledge. In the following three subchapters findings regarding case company's main three risk management processes are summarized from the point of view how processes structure risk information management in information collection, transformation and application phase.

On this area of risk information management main findings are:

- Importance of roles and responsibilities - ownership of risk information management
- Importance of defined systematic monitoring and update phase in risk information management process
- Opportunity to develop risk management framework implementation to key stakeholders
- Opportunity to develop and define business specific risk view that ensures risk information emphasis to the right areas
- Opportunity to develop process or model to manage customer demands and delivery regarding risk information

5.1 Collection phase

Risk management framework defines risk categories to support structuring of risk information. In research Company main categories are strategic and business risks, development risks and operational risks (see Graphic 11). Based on this categorization organization has defined processes for every category to manage risk information. These three processes structure risk information management in research organization and were further explored as part of theme interviews.

Risk Classification System
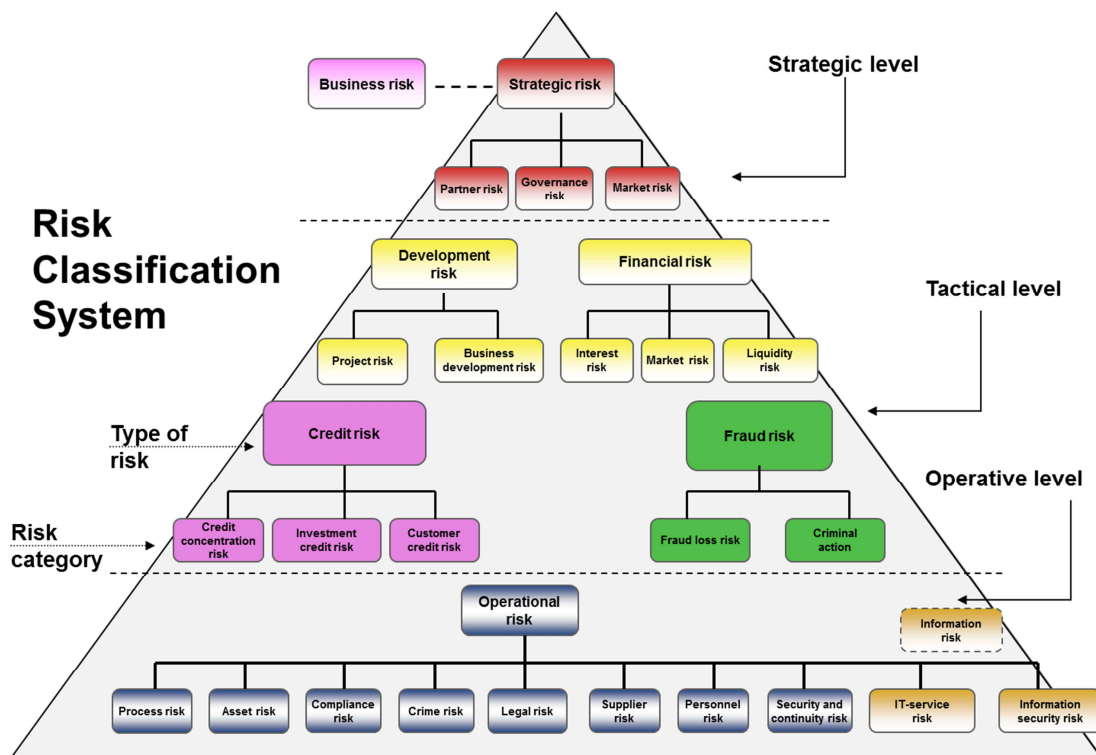
Graphic 11. Risk classification system of case company

In research organization strategic and business risks process is integrated part of strategy process and it was seen generally supporting business objectives. Information collection is based on identification of external and internal uncertainties as part of strategic planning for further assessment as part of strategy formulation.

Accountability of process execution and involved participants mainly from business unit management team was seen clear. Also tools assisting risk information management were seen supporting information management. According to the interviewees process has been efficient and effective and was seen creating additional value.

Execution of current development risk process includes risk information collection from overall project portfolio and from every single project. Information is collected according to the project management model from the planning phase trough execution phase until closing and hand over of deliverables to the production. There are defined tools for development risk collection and management. Interviewees commented that in their experience information collection in the beginning of the projects is supporting the planning and mainly owned and lead by project manager.

It was resulted from interviews that risk information is keenly collected as part of the initiation of projects but challenge is to actively collect and manage risk information during project execution. This means that emphasis of risk information collection of the projects is in the planning face all though large projects can have life cycle of years. According to the interviewees' experience generally projects also face and manage many issues during the execution but those are not discussed, identified or documented as risks. This might cause challenges in handover to production if risk information about deliverables is not complete.

Regarding the operational risk management process risk information collection is structured by business processes. Internal policies guide the process and in practice according to the interviewees execution is that from every process operational risks are identified and assessed yearly in workshops and status updated in the other half of the year.

Process owner has the responsibility to execute the operational risk process and invites the best participants regarding the individual process to the risk assessments. Participants are invited from all organizational units where IT specialists have a great role but also e.g. specialists from Finance have been used in the workshops. This process was identified to be affecting a large group of specialist and that has been also a challenge to manage to get right people at the same time to have a holistic discussion.

For the operational risk information collection there is defined tool called risk register what is used as information repository. There is one for every process and one for main process that combines all the risk information from individual processes. According to the interviewees tool is seen needed and support structuring the information but at the same time was seen complicated and not enough flexible to use.

It was discussed with interviewees that do they see that risk information is collected from the right areas considering holistic risk information support for decision making and general opinion is that from the business unit point of view and from the personal role point of view risk information is collected from the right areas. Both proactive and reactive (e.g. incident history) point of views are used in risk identification.

Other discussion area regarding risk information collection was that are there right personnel participating in current processes to ensure that best available information is collected when identifying and assessing the risks. Opinion was that so far situation has been good but some uncertainties are identified now in the new organization structure after merger. Interviewees emphasized that securing the participation from all needed organizational units is something that has to be criteria when defining new corporate processes. This was seen especially im-

portant regarding development and operational risk information which generally demand cross functional participation.

To conduct risk information management there are different tools for strategic risks, development risks and operational risks. According to interviewees there is an opportunity of development with tools. Development need where identified in usability of tools, automation instead of manual use, and capability to link risk information from multiple sources and reporting and presentation functions based on the imported information.

On this area of risk information management main findings are:

- Importance of framework defining prioritization of collection. Framework should support prioritization from business area angle.
- Importance of roles and responsibilities ensure best participants
- Importance of informal risk information
- Importance of processes to support systematic approach
- Opportunity to develop used tools
- In case company policy framework and execution in practice mainly align
- Opportunity to develop usage of external information (e.g. market changes, competitor activities)

5.2   Transformation phase

Regarding the strategic and business risks process' transformation phase includes assessment and evaluation of strategic risks according to the strategic risk assessment criteria defined in company risk management framework. Assessment includes review of each particular risk and detailed definition of a root cause and impact in a scenario that risk will realize. With this information evaluation of risk is conducted with defined risk scoring considering likelihood and consequences of risk. With evaluation risk significance is formed and so identified risk are prioritized and analyzed as part of strategy formulation.

Uncertainties included to the final version of the strategy are further assessed to identify possible mitigation actions. Respondents commented that this phase includes communication and consultation between business units and support units (e.g. seldom IT unit) to co-operate with assessment and mitigation definition. Interviewees saw this phase effective and supporting strategic planning. According to the interviewees used main method to execute the transformation phase has been workshops. Tool used to manage and save this information are various presentations.

In development risk process transformation phase includes two different assessment and evaluation of identified risks. One is analyze of business case risks regarding project deliverables and business case. This assessment have dedicated tool and responsible of the assessment is project owner. Regarding interviewees' comments owner will choose participants to this assessment. Mitigation actions are generally affecting to the scope and timing of the project. Because this assessment is done prior project start and if the risk outlook is high it can cause that project will not get permission to continue.

Other assessment done first time in the planning phase and continuously updated during the project is the assessment of risks that can affect to the execution in planned time, allocated resources and defined deliverables. According to the interviewees project manager is owner of the assessment and it's generally done by project core team members. There is defined tool to support assessment and evaluation with company defined assessment criteria regarding development risks. Tool is also information repository for this risk information.

With collected operational risk information transformation phase includes assessment of identified risks with root cause analyze and estimate of impacts. Assessment includes also identifying information about possible current mitigation or controls and definition of possible new ones. After assessment risk evaluation is done with risk likelihood and consequences according to the defined operational risk scoring.

Process owner is the responsible of the assessment and evaluation but interviewees emphasized that important in this phase is also communication and consultation holistically with stakeholders which can give input to the assessment. Every process has its own risk information tool which is synchronized manually to business unit risk master which compiles operation risk information from every process.

Interviewees commented that current tools used to manage risk information are various and some kind of consolidation with tools and risk information structure would support use of the tools and assessments. Interviewees appreciated that they have direct access to the tools and risk information that they own but also commented that there is chances of development in tools.

Main observed challenges with current tools were heaviness for efficient risk information management. It was seen that that tools should support modular structure where identified risk can be assessed with few mandated fields and additional only when seen needed. It was also observed that current tools do not support well any kind of graphic outcome of risk view for owner nor reporting capabilities. This is important findings because used tools are back-

bone of risk information management and should guide the process and support effective and efficient risk information management.

Other area discussed with respondents was risk assessment criteria and how well it currently supports risk assessments and so risk prioritization. There are currently many different criteria for different risk categories and interviewees commented that sometimes it seems complicated to know which one to use (see Graphic 12). It was also seen that more instruction to estimate risk likelihood or consequences would support risk evaluation. It was also commented that some kind of case examples would be good addition to support risk evaluation.

Graphic 12. Risk evaluation criteria, operational risks (Impact^{2} x Likelihood = Significance)

Important part of the transformation phase is also communication and consultation cross functionally with stakeholders and interviewees saw that communication has so far been open, effective and efficient. Though interviewees were partly worried that how this good communication can be secured in new organization after merger. Interviewees also commented that communication between specialists from different units regarding risks or uncertainties is many times executed informally. This informal risk information communicated example with during coffee breaks was seen important among respondents.

On this area of risk information management main findings are:

- Observed development needs with tools used to manage risk information (consolidation, automation, reporting capabilities)
- Opportunity to consolidate and develop usability of risk information management tools from different processes to one single platform
- Variety of different risk assessment criteria for different risk categories. Possible opportunity to consider consolidation.
- Importance of cross functional communication regarding risks. Importance of informal discussion regarding risk information.

5.3   Application phase

Regarding the strategic and business risks process application phase includes strategy formulation and update with identified risk information. Identified risks are integrated to the business unit's strategy plan and are also communicated to the board of directors in strategy planning phase. When moving from planning to the strategy execution phase implementation of set risk mitigation actions is ensured by defined owner of mitigation actions.

According to the interviewees application phase includes quarterly follow up of strategic risk view to ensure that set mitigation actions proceed according set schedule and to observe possible new uncertainties according to the changes in external and internal environment. This is conducted with management team review. Strategic and business risks process includes also biannual reporting to the board of directors about the risk status. Main application of this strategic risk information is to identify and manage uncertainties that can effect to the strategic objectives.

Development risk process application phase includes assessment of identified project business case risks before making decision that is project started, postponed or rejected. For accepted and started ones project risk information is used in planning phase to adjust plan to mitigate risks and in execution phase to execute and ensure mitigation actions. Risk view of individual projects is reported monthly to project portfolio board by project manager and board reviews risk position of whole project portfolio. Portfolio status with risk view is also reported monthly to business unit management team.

Respondents commented that regarding development risk process there is also important phase in the project closing stage where lessons learned also regarding risks are analyzed and collected. Lesson learned include both positive and negative matters. This information is presented in project closure presentation but respondents identified a challenge that how this valuable information is stored and offered to support new projects.

Other observation by interviewees was that currently situation has developed but there have been cases where information about risks is not efficiently transferred to production in the project closure and handover phase. Generally it can be concluded that application of development risk information is to identify and manage uncertainties that can effect to the development portfolio.

Part of the application phase regarding the operational risks is the risk decision making and escalation from process owner to the main process owner who is business unit leader. Risk decisions are recorded with risk register to support status monitoring and mitigation execu-

tion follow-up. After the risk decision making defined mitigation actions are executed and monitored where process owners have responsibility to follow-up mitigation and update status to the risk register so that risk information would stay up to dated. Main application of operation risk information is secure daily operations and support process development.

In this area results from the interviews conclude that general frequency of operational risk information updates is bi-annual guided operational risk reviews. Part of the application phase is compiling and reporting most significant operational risks to the management team of business unit and to the board of directors bi-annually.

Interviewees are working in different levels of organization hierarchy so one interesting discussed area was risk decision making and escalation process which is important element of efficient risk information management. In document analysis it was identified that organization has defined decision making levels regarding the risk significance as part of the framework.

Framework model and detailed decision levels were not thoroughly familiar to interviewees but when asking from operational level representatives and senior management representatives that did they see that it is clear what to escalate they felt that it is clear. When further inquiring from senior management that from their experience has right issues been escalated to them they felt that escalated information has been on the right level.

When asking how interviewees define the escalation criteria answer was that reasoning is more about their individual overall impact estimate of risk and common sense than defined quantitative criteria. That is an interesting result and is observed to mean that also informal information, subjective knowledge and understanding of individuals is always vital with risk escalation criteria. Regarding large amount of risk information example with operational risks defined escalation criteria is aimed to support efficiency, secure objectivity and ensure decision according to jurisdiction of the role (Hopkin 2010). Interviewees commented that in business as usual risk decision making defined risk escalation criteria is supporting efficiency.

Many risk management frameworks (see e.g. Hopkin 2010, 54, ISO 31000, COSO ERM, Merna & Al-Thani 2008, 47) describe that all risk information should be in the knowledge of top management but based on the research results there needs to be escalation layers that support efficiency of risk management. Clear decision making structures support that relevant risk information is managed with right organization level and only most significant high risks reported to senior management.

One important aspect of application phase is communication of risk information where one element is risk reporting. This area was discussed with interviewees and generally they saw that current risk reporting is sufficient in each risk category and supporting execution of their role. Opportunity of development where identified in mechanism that would compile risk information from multiple categories enabling better comparison of access to comprehensive risk view of business unit.

Vital part of risk aware culture is communication about risk information which is example identified risks and agreed mitigation actions. Regarding risk reporting and risk information communication interviewees raised up that from each risk category there is down-top communication line but also communication line to share risk information from top-down would support stakeholders. Especially in categories where information is affecting to whole business unit like with strategic and business risks.

One element that can support effective and efficient risk information management is defined Key risk indicators (Hwang 2010, 125-140). These set indicators set tolerance level to the daily operations and guide management that when those are acceding attention and action are required. After all time of management is always limited and this kind of parameter setting would be beneficial element on risk information management.

On the other hand KRI setting has to be considered by risk information category. For example with credit or fraud risk realization where financial figures are easy to monitor setting of KRI's is not difficult. But when considering example strategic or operational risk information parameter setting is much more challenging. In these categories used indicators can be risk significance by evaluation with defined risk criteria. KRI's should support management of large amount of risk information and escalation in risk decision making.

On this area of risk information management main findings are:
- Importance of clear escalation criteria
- Importance of communication regarding risk information
- Importance of set Key Risk Indicators
- Importance of holistic comparable risk view
- Opportunity to develop compiled risk view for business unit
- Opportunity to develop Top-Down risk information communication
- Opportunity to develop usage of lessons learned information of projects

6   Identified success factors and development opportunities of RIM

In this chapter research results regarding identified risk information management success criteria are presented with findings of development opportunities in the research case. Findings are divided to four fundamental elements of risk information management.

Identified success factors regarding risk information management can be categorized by four main elements of risk information management 1. external and internal environment, 2. Risk management framework and policies, 3. Risk management processes and practices and 4. Risk management communication and consultation.

Considering the case and the risk information management fundamental element external and internal environment (see Table 13.) finding is that systematic process to identify risk information obligations like risk reporting to authorities or customers forms one success criteria. To ensure fulfillment of these obligations in risk management there should be holistic mapping and process to manage and update the mapping. This in a remarkable way builds efficiency and quality of risk information management, protects from ad-hoc assignments and supports development where holistic approach to collect information can be planned without overlap of processes.

Other identified success factor in this area is internal demands. Internal demands are two folded first success criteria is demands from the shareholders through board of directors about the risk information that is seen needed which support risk information management with same argumentation as external obligations discussed above. Other dimension is that every business area should evaluate and prioritize that what are the risk categories and so risk information that are important support for that individual business area.

Identification of requirements is crucial support for efficiency and effectiveness of risk information collection processes. Practical element to enhance this area is defining for example risk dashboards with defined Key Risk Indicators (later KRI). Dashboards support clear view about risk position for executive management but at the same time set objectives for needed risk information and form. This is also step in building risk aware culture (Hopkin 2010, 104-108) but also substantial support for risk information management.

These set indicators set tolerance level to the daily operations and guide management that when tolerance levels are acceding attention and action are required. After all time of management is always limited and this kind of parameter setting would be beneficial element for risk information management. On the other hand KRI setting has to be considered by risk in-

formation category. For example with credit or fraud risk realization where financial figures are easy to monitor setting of KRI's is not problematic. But when considering example strategic or operational risk information parameter setting is much more challenging. In these categories used indicators can be risk significance by evaluation with defined risk criteria. KRI's should support management in all levels with large amount of risk information and with escalation in risk decision making.

Also usage of external risk information was identified as a success factor. Organization should identify and prioritize the external sources for risk information management. Prioritization is bound to risk information categorization mentioned in previous chapter. External information sources include public information or non-public like contractually agreed risk reporting from subcontractors.

EXTERNAL AND INTERNAL ENVIRONMENT		
Success factor	Status in Case organization by research results (1 development opportunity – 2 adequate – 3 mature)	Identified development opportunity in Case
Are external and internal obligations for risk information systematically identified and managed?	1	Holistic process to map and manage obligations (e.g. obligations from authorities, customer contracts)
Are internal requirements for risk information identified and prioritized? (including Risk dashboard and KRI setting)	1	Framework definition in organization and business unit level for risk categories where risk information should be produced
Are external sources for risk information identified, prioritized and managed?	1	Framework to use external risk information (market changes, competitor monitoring, subcontractor risk information)
Are most important sources of internal and external risk information identified and defined?	2	

Table 13. RIM success criteria regarding external and internal environment

Under fundamental element framework and policies several success criteria were identified (see Table 14). Definition of roles and responsibilities for risk management is also significant success factor for risk information management. Framework should define responsibilities from information sources definition to executors of processes and risk information reporting. Role definition should include risk decision making levels to support that identified risk information is managed on right management levels and accurate risk information escalated to executive management.

According to research results role definition should clearly state responsibility to update risk information. This responsibility can be supported in process with control point like reporting demand to executive management two times a year. Lack on this area can results to the situation where collected risk information is not updated and all the resources are used the up-

date old not relevant information. Also holistic roles in organization to support efficient and effective risk information management should be defined including framework and policy implementation responsibility.

Other remarkable support for risk information management regarding information accuracy and quality are definition of risk categories and risk assessment criteria in framework and policies. Lack on this area leads to situation where multiple methods are used and risk information is fragmented and not manageable or comparable. This success criteria supports efficiency and understanding among stakeholders who participate to the risk evaluation and effectiveness with in decision makers where risk information is easier to adopt.

Like with risk management (Hopkin 2010, 110-115) implementation, support and continuous development were identified to be success factors regarding risk information management. General response from stakeholders was that this is an area where continuous support is needed to ensure quality of information. This success criteria is integrated part of risk management and should be recognized as one area in holistic support planning. One practical example that arose from the interviews was that how stakeholders can be assumed to do risk assessments if they have never received any education or support in the area. Strong internal obligation and stress for risk management with lack of implementation and support weakens also risk aware culture.

FRAMEWORK AND POLICIES		
Success factor	Status in Case organization by research results (1 development opportunity – 2 adequate – 3 mature)	Identified development opportunity in Case
Are roles and responsibilities regarding risk information management defined as part of risk management framework?	2	Development opportunities regarding roles between units and in units in the new organization
Are escalation and risk decision making levels defined?	1	Development opportunities regarding many processes
Is definitions for risk information defined in the framework and policies (e.g. risk categories, risk assessment criteria) ?	1	Many overlapping methods and opportunity of consolidation
Are framework and policies to support for risk information management implemented to organization?	1	Development opportunity to create systematic implementation and support program
Is continuous development regarding risk information management part of the framework (e.g. yearly feedback collection from stakeholders) ?	1	Development opportunity to create systematic development program with defined roadmap including stakeholder feedback.

Table 14. RIM success criteria regarding framework and policies

The most important fundamental in risk information management that other fundamentals mainly support is processes and practices for information collection and management. Also most of the success criteria where identified on this area (see Table 15). The dependencies between external and internal environment and framework and policies set the ambition and processes and practices should produce it efficiently as possible. Risk management processes and practices should be developed as integrated to the other processes as possible.

Success factors in this area of risk information management are that risk management processes should as automatically and efficiently as possible produce risk information required. Part of this success factor is that there is centralized risk information repository which includes current up to date information to prevent multiple overlapping information gathering processes. This supports portfolio approach to risk management and understanding of dependencies of risks as part of decision making. In a practical level this means that holistic risk view is hard to form if information is in separated assessments and emails. In mentioned risk information repository each stakeholder should have access to the risks that they own.

Besides the importance of processes tools and techniques were identified to play a major role in the success of risk information management. Tools and techniques should be easily available and educated to stakeholders. With tools and techniques usability and efficiency were also identified to support risk information quality. Identified success criteria was also alignment of risk information management with organizations information management processes.

PROCESS AND PRACTISES		
Success factor	Status in Case organization by research results (1 development opportunity – 2 adequate – 3 mature)	Identified development opportunity in Case
Are processes, practices and tools automatically creating output needed for internal and external risk reporting? (risk reporting, risk dashboards)	1	Development opportunities were identified
Are tools and techniques for risk information management known and easily available?	1	Development opportunities were identified
Are usability and efficiency taken into account with in tools and techniques?	1	Opportunity to consolidate and develop usability of risk information management tools from different processes to one single platform
Does tools and technique support holistic portfolio approach (centralized risk information repository)	1	Development opportunities were identified
Do risk owners have access to the current risk information on their responsibility area?	1	Development opportunities were identified
Is risk information management aligned with organizations information management processes?	1	Development opportunities were identified

Table 15. RIM success criteria regarding RM processes and practices

Regarding the risk information management fundamental communication and consultation success factor of common risk management and vocabulary where identified (see Table 16). When stakeholders discuss regarding risks it common understanding builds efficiency and support quality of results. When especially stakeholders from different units discuss about risk information linking risks to organizational objective or process were identified to support understanding. This same element supports also management of large amount of information and decision making. Objective or process linkage is beneficial to consider when building metadata for risk information repositories.

One remarkable success factor in this area is informal discussions between stakeholders about uncertainties or risks identified referred as coffee-machine conversations (identified also by Alvesson 2002 and Ornstein 1991). As its informal nature this success factor is hard to support by framework or processes but good to understand when aiming to develop risk information management in organization. In risk information flow perspectives this area should be supported and the ones developing risk management should encourage this area activity and participate. Main element is to empower people and build trust openly discuss about possible uncertainties.

Risk management processes are seldom build to collect risk information from top down, but risk information flow also from top-down should be ensured to support general understanding and activities on prioritized risk areas. Good practical area is information regarding strategic risks where process generally is executed with participants from executive management. Outcome of the process is identified significant uncertainties and set mitigation actions. Ensuring that information on this area is shared build understanding and commitment to defined activities among employees.

COMMUNICATION AND CONSULTATION		
Success factor	Status in Case organization by research results (1 development opportunity – 2 sufficient – 3 good) / identified priority	Identified development opportunity in Case
Is common language and vocabulary defined in organization?	1	Development opportunities were identified
Are risks linked to objective or process to support understanding? (metadata in risk information repository)	1	Development opportunities were identified
Are risk information category, responsible, and tools mapped to manage information?	1	Development opportunities were identified
Is silent knowledge and active informal discussion between stakeholders supported in risk management?	2	Development opportunities were identified
Is down-top information flow defined as part of RM processes?	1	Development opportunities were identified

Is top-down information flow defined as part of RM processes?	1	Development opportunities were identified

Table 16. RIM success criteria regarding communication and consultation

Comparing identified success factors with current situation it can be concluded that there are many development opportunities in the area of risk information management in case organization. Development of risk information management is understood as integrated part of organizations risk management development. Research results in the risk management support that risk management success criteria is individual for every organization and that is also conclusion from the review of risk information management in this particular research case.

Success criteria of risk information management are identified to support phenomenon development in this organization and cannot be interpret to be general success criteria. Nevertheless identified success factors of risk information management were turned to form of questions to serve at least baseline review of risk information management maturity in other organizations.

7   Conclusion and recommendations

In this Chapter research questions are studied with research results. Identified findings are summarised including development opportunities. On the basis of the research results recommendation proposal towards effective and efficient risk information management is presented.

Research problem of the thesis was to understand, structure and identify success factors of risk information management in the case organization. Research problem was based on an interesting identification from current field situation about risk management success factors. Current field literature and results of previous research (e.g. Fraser & Simkins, 2010, Hopkin, 2010 and Merna & Al-Thani, 2008) together with risk management standards like ISO 31000 and COSO ERM which define globally accepted best practices for risk management emphasize that risk management should be implemented as a process and continuity is a key to productive risk management.

Frameworks also underline that risk management should be holistic and risk assessments implemented to all operations of the organization and preferably risk information collected from different perspectives. On the other hand there is shared understanding that high-quality and up to date risk information should always be as part of the decision making.

To achieve these three ambitions at same time requires that risk information produced from risk management process (process e.g. ISO 31000 or Hopkin 2010) is managed according to these objectives. Although agreeing on the ambitions the current knowledge (e.g. Fraser & Simkins, 2010, Hopkin, 2010 and Merna & Al-Thani, 2008) does not go much deeper on what are the key elements for successful risk information management.

This opened an interesting question about what is the structure of risk information management and the criteria for the risk information management to achieve these intentions. Thesis was approaching this question in single case of financial institution from the perspective of the needs of that particular entity with set main research question: *"What is the structure, implementations and a current state of risk information management?"* To be able to answer better to the main research question also sub questions were defined like presented in Table 17.

BENEFITS OF THE THESIS	RESEARCH QUESTIONS / PROBLEMS
1. INFORMATION ABOUT STRUCTURE, IMPLEMENTATIONS AND THE CURRENT STATE OF RISK INFORMATION MANAGEMENT	Main: What is the structure, implementations and a current state of risk information management?
2. INFORMATION ABOUT DEVELOPMENT AREAS OF RISK INFORMATION MANAGEMENT ("*what is*	1. Sub: What are the external and internal demands for the risk information management?

good and what needs to be developed")	2. Sub: How risk information management is executed as part of risk management process and framework
- Supports business unit level development - Supports corporate level risk management process definition and development and development - Supports corporate level GRC tool acquirement project	3. Sub: What are the best practices for risk information management according to the earlier research and field literature

Table 17. Research questions

Based on the research results risk information management is understood as integrated part of risk management. This integrated element should be supported in definition of risk management framework, processes and procedures. If not defined the value of risk information is at risk. Risk information management where identified to consist of four fundamental elements. As part of the research results success criteria for every fundamental element was identified as in high level illustrated in Graphic 13 and status of success factors with development opportunities described more detailed in chapter 7. In general some structures are in place but many development opportunities to support more efficient and effective risk information management were identified.
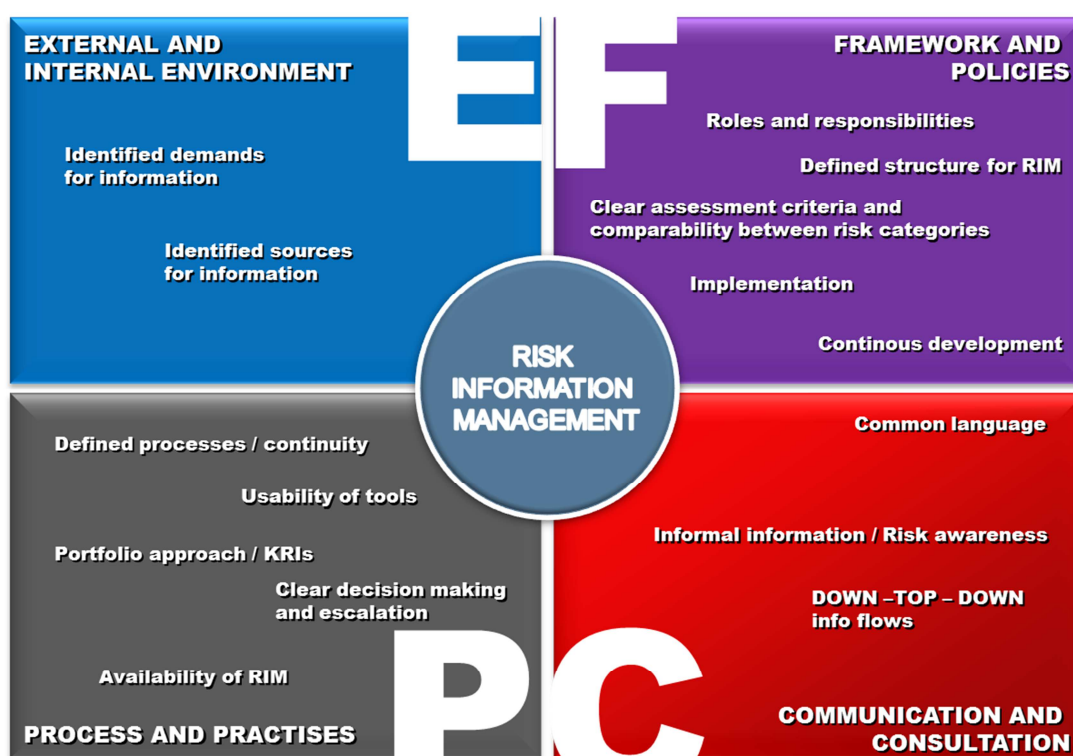
Graphic 13. RIM elements and key success criteria

Current situation is identified to be strongly linked with maturity of risk management in organization and maturity to age of new organization after major merger. Current situation on the other hand offers a great opportunity to use and apply research results when

organization's risk management framework and processes are currently defined and then implemented to the organization.

All though in general many development opportunities were identified stakeholders from business who were participating to the research reflected that current status of risk information management is in adequate level. It was observed that stakeholders of course based their opinion to the history and current situation. Stakeholders at the same time were concerned about how good current practises will work in the new organization. This is based to the overall finding that still local daily processes are working without organizational risk management framework or policies. From these findings it is concluded that executing identified development opportunities and building the systematic risk information management framework is the only option to recommend when ambition is efficient and effective risk information management in whole organization.

On the basis of the research results following approach is recommended for development of risk information management in case organization (see Graphic 14). First priority is holistically identify, map and prioritize external and internal demands regarding risk information and at the same time define framework and policies for risk management. Second step is to build processes with responsible to ensure risk information collection and management with key risk indicators to response to the identified requirements. Processes should be supported with efficient tools for risk information management. Third step is to ensure continuous development and feedback collection from risk owners.

Identify demands and deploy RM framework
First priority is holistically identify, map and prioritize external and internal demands regarding risk information and at the same time define framework and policies for risk management.

Implement Processes
Second step is to build processes with responsible to ensure risk information collection and management with key risk indicators to response to the identified needs.

Ensure Continous Development
Third step is to ensure continuous development and feedback collection from risk owners.

Graphic 14. Recommended approach for RIM development

8   Assessment of thesis towards set objectives

In this chapter success of thesis execution is reflected against set research and individual objectives. Performance is evaluated regarding set research objectives including assessment of selected methodology and information collection techniques. Additionally success of thesis and research process is evaluated from the subjective learning experience point of view.

Considering main objective of thesis what was to understand better phenomenon of risk information management in this particular case organization objective was over all achieved. Ambition was to approach the phenomenon from point of business owners and also on that area research succeeded with managing to get owners to participate to the research and have open and active dialog regarding research concept. All together research managed to answer to all set research questions and provided new information for organization's risk management development and future studies in the case organization or in general regarding the research phenomenon risk information management. Common challenges of Case researches like Benbasat & Co. (1987) describes were identified already in planning phase which supported the execution.

Case study as a selected research method supported well the set objective to intensely understand the research phenomenon in one specific organization. Considering improvement areas regarding the methodology information collection from other cases as well and comparing the results would have been rather interesting but regarding the resources and possible challenges to retrieve this level information from other organizations multi case approach was unfortunately not possible in this thesis.

The single case approach of research is important to recognize when interpreting the research results. Like Darke & Co. state (1998) according to Lee (1989) a single case represent a single set of empirical circumstances, as does a single experiment, and the findings of the single case are generalizable to other empirical settings when additional cases test and confirm those findings in other settings. This is also identified opportunity for future studies to collect same area information from other company and review results against results of this study. One finding in thesis was that risk information management success factors in practical level are rather organizational so future studies would give opportunity to review closer the finding.

Considering selected research approach and execution of intensive case study it provided good support for the research. Cunningham (1997) states that in case studies one method to support accuracy of findings is to use review the findings with field people in the field setting. This method was used as quality assurance and result and findings of the thesis were discussed with the organization's chief risk officer who didn't participated otherwise to the execution of the research. The result of the discussion supported findings as the chief risk officer agreed with the results from his point of view.

Selected information gathering techniques served also well the purposes. Literature review provided good base for proceeding with execution of documentation analyses and theme interviews. Good portion of earlier academic research on the area was found all tough specifically earlier research on risk information management was narrow. This was though also a finding in the research process.

A documentation analysis was targeted to include all the documentation that can set demands to the organization regarding risk information management. When now afterwards reviewing the scope of documentation analyses, out scoped important area of customer contracts, is an area that would be beneficial to take in scope. Fact that thesis research report is public was of course effecting to the decision that strictly confidential customer agreements were out scoped but it is important to understand that contractual demands are essential part of risk information management in organizations.

Theme interview structure constructed by results of literature review and documentation analyses functioned well in the interviews. All the interviews succeeded to create active discussion around and about research phenomenon and provided so a lot of information for the study. Also interviewees from different roles in risk management process provided good results with people looking same process from different perspectives. Phases and order between information gathering with literature review, documentation analyses and theme interviews served well the research process.

Main identified improvement areas in the research were rather small sample of representatives regarding the business units and theme interviewees. Wider scope of business units and sample of interviewees would have built even stronger evidence regarding the results. Scoping of research is important to recognize when interpreting the research results. When now reviewing the results it is still believed that reasoning behind the scope to support deep dive in one business unit to support quality of results was one of the success factors of the research.

Other areas that succeed in the thesis were execution in planned schedule and in planned scope. One aspect that reflects the success of execution was that now major changes were made to the original plan during the process. Regarding timing of the research one objective was that research results can be exploited in organization's risk management development and this seems to fit as according the business planning this year 2014 will include many activities in the risk management framework and process development sector. As a summary I see that research had produced information in all three levels defined for Master's thesis of Laurea University of Applied Sciences. Thesis has managed to produce knowledge in practice, knowledge of practice and knowledge for practice.

From the individual perspective the research has been a great learning opportunity with two folded benefits. Firstly research process and results have greatly improved my understanding about phenomenon of risk information management in general and especially in the case organization. Secondly the research process has also produced other information that was not in the research scope but is beneficial when executing my working role. These both will serve my current and future success with individual responsibility to ensure and develop effective and efficient risk management in employee organization.

I would like to end the thesis with warm thanks to my employee organization about opportunity to execute the thesis, to my colleagues for participating to the research and also to my family for overall support during the process.

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Graphics

Tables

Appendices

Appendix 1 Findings of literature review and document analysis

Document	Published	Origin country	Author / Approver
LITERATURE REVIEW: BEST PRACTICES INFORMATION			
ISO 31000	**2009**	**Global**	**International Organization for Standardization**
Category: 1. external and internal environment, 2. Risk management framework and policies, 3. Risk management processes and practices and 4. Risk management commu-nication and consultation	**Finding**		
2. Risk management frame-work and policies	Introduction of standard : a framework where purpose is to integrate the process for managing risk into the organization's overall governance, strategy and planning, management, reporting processes, policies, values and cul-ture.		
3. Risk management pro-cesses and practices and 4. Risk management communi-cation and consultation	Principle f) RM should be based on the best available information		
3. Risk management pro-cesses and practices and 4. Risk management communi-cation and consultation	communication and consultation: continual and iterative processes that an organiza-tion conducts to provide, share or obtain information and to engage in dialogue with stakeholders (2.13) regarding the management of risk (2.1) see also notes 1 and 2		
2. Risk management frame-work and policies, 3. Risk management processes and practices and 4. Risk man-agement communication and consultation.	page 8, The framework ensures that information about risk derived from the risk management process is adequately reported and used as a basis for decision making and accountability at all relevant organizational levels. See framework figure 2. Framework should set base also for RIM. Taking in to account e.g. information sys-tems, information flows and decision making processes (both formal and informal)		
2. Risk management frame-work and policies, 3. Risk management processes and practices and 4. Risk man-agement communication and consultation.	4.3.6 Establishing internal communication and reporting mechanisms relevant information derived from the application of risk management is available at appropriate levels and times; and there are processes for consultation with internal stakeholders. These mechanisms should, where appropriate, include processes to consolidate risk information from a variety of sources, and may need to consider the sensitivity of the information.		
1. external and internal environment	4.3.7 RIM should include and support also external communication		
3. Risk management pro-cesses and practices and 4. Risk management communi-cation and consultation	5.3.5 importance of risk criteria for RIM		
3. Risk management pro-cesses and practices and 4. Risk management communi-cation and consultation.	5.4.2 Risk identification: The organization should apply risk identification tools and techniques that are suited to its objectives and capabilities, and to the risks faced. Relevant and up-to-date information is important in identifying risks. This should include appropriate background information where possible. People with appropriate knowledge should be involved in identifying risks.		
3. Risk management pro-	**5.6** Both monitoring and review should be a planned part of the risk management		

cesses and practices	process and involve regular checking or surveillance. It can be periodic or *ad hoc*. Responsibilities for monitoring and review should be clearly defined.		
3. Risk management processes and practices	5.7 Recording the risk management process, Importance of recording to manage information		
COSO ERM - Enterprise Risk Management - integrated Framework	**2004**	**USA**	**Committee of Sponsoring Organizations of the Treadway Commission (COSO)**
2. Risk management framework and policies	1) Undisputed importance of risk information management as part of framework		
2. Risk management framework and policies	2) Importance of risk management framework setup from the point of individual organization		
4. Risk management communication and consultation.	3) Importance on communication and consultation in RIM		
Fundamentals of Risk Management: understanding, evaluating and implementing effective risk management	**2010**	**USA**	**Hopkin**
2. Risk management framework and policies	1) Risk information management seen as part of risk management		
2. Risk management framework and policies, 3. Risk management processes and practices	2) Importance of roles and responsibilities to support RIM		
3. Risk management processes and practices	3) Importance of defined process, practices and tools in risk management and risk information management		
3. Risk management processes and practices	4) Examples of tools and practices to support risk information management		
Corporate Risk Management	**2008**	**Great Britain**	**Merna & Al-Thani**
2. Risk management framework and policies, 3. Risk management processes and practices	1) Importance of systematic risk information management to support efficiency		
2. Risk management framework and policies,	2) Importance of risk management development from the point of individual organization		
4. Risk management communication and consultation.	3) Importance on communication and consultation in RIM		
Enterprise risk management. Today's Leading Research and Best Practices for Tomorrow's Executives	**2010**	**USA**	**Fraser & Simkins(edit.),**
2. Risk management framework and policies	1) Framework and process elements in Risk management modeling		
3. Risk management processes and practices	2) Examples of tools and practices to support risk information management		
2. Risk management framework and policies	3) No structure or success criteria of RIM identified in earlier Academic ERM research till 2010		
2. Risk management framework and policies, 3. Risk management processes and practices	4) Importance of Key Risk indicators in RIM		
Article: How Boards of Directors Perceive Risk Management Information	**2011**	**USA**	**Ballou, Heitger and Stoel**
2. Risk management framework and policies, 3. Risk management processes and practices	1) Overall results suggest that BOD's do not receive sufficient information about RM processes with risk information to be able to understand and evaluate the risks and quality of risk responses		

2. Risk management framework and policies, 3. Risk management processes and practices	2)Risk information generally includes only short term financial impacts and is not tied to KPI's which would build understanding
2. Risk management framework and policies, 3. Risk management processes and practices	3) Portfolio view of risks information supports efficiency and effectives of risk information management
Article: The role of information in risk management, in contemporary economy	**2009 Romania Danu**
2. Risk management framework and policies, 3. Risk management processes and practices	1) Circumstances of today's rapidly changing business environment challenges risk information management
2. Risk management framework and policies, 3. Risk management processes and practices	2) Due multiple variables and change with every individual organization it is not possible to build one theoretical model for RM/ RIM
2. Risk management framework and policies, 3. Risk management processes and practices	3) Complexity increases importance of qualitative information gathering and analysis
1. external and internal environment	4) Customers are important source of risk information
Article: Managing corporate risk trough better Knowledge Management	**2005 USA Neef**
1. external and internal environment	1) Knowledge and expertise of employees is vital for RIM (mapping knowledge to asses risk)
2. Risk management framework and policies, 3. Risk management processes and practices	2) Indicators and measuring also in field of risk management are important for management
2. Risk management framework and policies, 3. Risk management processes and practices	3) Assessment and escalation procedures are important to prevent "information overload"
3. Risk management processes and practices	4) Tools can structure and support RIM
1. external and internal environment	5) Use of external information is essential for effective risk management

Document	Published	Origin country	Author / Approver
INTERNAL DEMANDS (Mandatory)			
Description of company management system	06/2011	Finland	Risk Management unit / Approved by Board of Directors
Category: 1. external and internal environment, 2. Risk management framework and policies, 3. Risk management processes and practices and 4. Risk management communication and consultation	**Finding**		
2. Risk management framework and policies	Defining management model, management process and as part of that accountability regarding RM, → business unit is accountable it's risks and responsible for executing risk management processes in business unit's operation		
2. Risk management framework and policies, 3. Risk management processes and practices	Defines how strategic risk management is part of strategy process		
Principles of internal control	06/2011	Finland	Risk Management unit / Approved by Board of Directors
2. Risk management framework and policies, 3. Risk management processes and practices	defining strategic risk, operational risk, development risk, credit risk, fraud risk, market and finance risk,		
Description of risk management framework	06/2012	Finland	Risk Management unit / Approved by Board of Directors
2. Risk management framework and policies, 3. Risk management processes and practices	Defining 4-staged risk classification model (risk area, class, name and risk description		
2. Risk management framework and policies, 3. Risk management processes and practices	Defining numeric scales for risk evaluation, for likelihood and magnitude which define risk significance , one for strategic risk and other for operational risks		
3. Risk management processes and practices	Defines company risk management process and demand to manage strategic, process, IT-system and operational risks		
3. Risk management processes and practices	Process and IT-system risk assessment has to be conducted at least to all <u>significant</u> processes and IT-systems biannually. Defines that outcome of assessment has to be documented to risk register. Defines stakeholders that should contribute to risk assessment, process experts, IT-system owner/specialists, finance department. Also defines that the process interfaces has to be in scope of evaluation.		
2. Risk management framework and policies, 3. Risk management processes and practices 4. Risk management communication and consultation	Process owner responsible for process risk assessment, IT-system technical owner responsible for identification and assessment of IT-system risks BU leader for IT-system risk decisions		
3. Risk management processes and practices	Defines process for reporting new risk to risk management that is not in an observer's responsibility area. Can also be reported anonymously as "whistle-blower" channel.		
, 3. Risk management processes and practices	Defining incident reporting process to supervising authority (FIN-FSA). Responsible for reporting incident is process owner.		
2. Risk management framework and policies, 3. Risk management processes and practices 4. Risk management communication and consultation	Defining risk decision making, 4- staged acceptance levels, (sets demand also for reporting and escalation of risk), defines demand to document all risk decisions		
2. Risk management framework and policies	Defines that BU leader is responsible for operational risk management and process owner for process risk management, BU leader responsible for that BU risk register/risk information is up to date		
2. Risk management framework and policies, 3. Risk management processes and practices 4. Risk management communication and consultation	Defines that annual reporting of strategic risks to board is mandate Defines biannual mandate reports to board I which include status of credit, fraud, market- and finance and operational risks *(sets demand of collecting, managing and reporting mentioned risk information)*. Development risks has to be reported quarterly. Defines that reporting to supervising authority is done when demanded.		
3. Risk management processes and practices	Guides where information about tools to risk assessments is available. Defines risk register for operational risks and risk register for development risks.		

Principles of operational risk management	06/2011 Finland Risk Management unit / Approved by Board of Directors
2. Risk management framework and policies	Defines Operational RM responsibilities especially of Business Unit and process owner
2. Risk management framework and policies	Defines parts of company RM terminology, operational risk classification and process
2. Risk management framework and policies	Operational risk status has to be reported to Board of directors biannually *(sets demand to collect information, prioritize and report status to the Board)*
2. Risk management framework and policies, 3. Risk management processes and practices	BU leader has to assess risks in scope of business and define most significant operational risks. Has to ensure that these risks are taken into account in annual business plan *(sets demand to collect information and report that to BU leader)*
2. Risk management framework and policies, 3. Risk management processes and practices	Process owner is responsible for identification of process risks, setting mitigation actions and setting appropriate controls to process

BU leader is responsible for identification of IT-system risks, setting mitigation actions and setting appropriate controls |
2. Risk management framework and policies, 3. Risk management processes and practices	Process and IT-system risks assessment has to be conducted at least biannually. Additionally in line with great changes, before out sourcing decision or before taking new products or services to production phase
2. Risk management framework and policies, 3. Risk management processes and practices 4. Risk management communication and consultation	Process owner is responsible for conducting mitigation actions and reporting of status
Work instruction: How to process operational risks	03/2012 Finland Risk Management unit
3. Risk management processes and practices 4. Risk management communication and consultation	Defines parts of company RM terminology
2. Risk management framework and policies, 3. Risk management processes and practices	Process risk has to be assessed biannually by process owner
IT-system risks has to be assessed biannually by system technical owner
3. Risk management processes and practices	defining what should be documented about recognized risk (e.g. root cause, and effects to business)
2. Risk management framework and policies, 3. Risk management processes and practices	Defining numeric scales for operational risk evaluation. Guides that process owner should asses from process perspective and business unit owner from business unit perspective.

Defines that Business unit leader is in charge of defining most significant operational risks and should ensure that mitigation actions are part of business planning |
| 2. Risk management framework and policies, 3. Risk management processes and practices | Defines how risk decisions are made, risk acceptance in current state OR with defined new mitigation actions

Defines that all risk decisions has to be documented |
| 2. Risk management framework and policies, 3. Risk management processes and practices | Defines that all documented risks mitigation actions should have schedule and responsible person |
| 2. Risk management framework and policies, 3. Risk management processes and practices | regarding service production operational risks should be reviewed at least monthly |
| 2. Risk management framework and policies, 3. Risk management processes and practices | Defining risk decision levels regarding risk significance and euro value

if mitigation plans change new documented risk decision has to be made according to risk decision mandates |
2. Risk management framework and policies, 3. Risk management processes and practices	defines that monthly reporting to Business unit Mgmt team is mandate, weekly review of incidents in service production week meeting, biannual reporting to risk committee, which report biannually to BOD
2. Risk management framework and policies, 3. Risk management processes and practices	States that risk information Is managed with company risk register (risk, incidents)
Principles of market- and financing risk management	11/2010 Finland Risk Management unit / Approved by Board of Directors
2. Risk management framework and policies, 3. Risk management processes and practices 4. Risk management communication and consultation	Reporting monthly about market and finance risks to board, management in charge and RM committee

Credit risk strategy	06/2012	Finland	Risk Management unit / Approved by Board of Directors
2. Risk management framework and policies, 3. Risk management processes and practices	Setting limits to credit risk (which effects to information gathering, monitoring and reporting)		
2. Risk management framework and policies	Describing BU leader responsibilities regarding credit risk management (e.g. limit setting and evaluation of credit risk of new products)		
2. Risk management framework and policies, 3. Risk management processes and practices	Bu is responsible about monitoring credit risks, limits, and monitoring levels. Also about monitoring quality, growth and revenue targets. Credit risk management has responsibility to monitor set limits and report monthly about status and immediately if set limit are exceeded		
2. Risk management framework and policies, 3. Risk management processes and practices	defining credit risk monitoring limits		
Principles of credit risk management	06/2011	Finland	Risk Management unit / Approved by Board of Directors
2. Risk management framework and policies, 3. Risk management processes and practices	BU leader has to ensure monthly credit risk reporting to risk committee		
3. Risk management processes and practices	Defines how credit risk should be measured		
Principles of fraud risk management	06/2011	Finland	Risk Management unit / Approved by Board of Directors
2. Risk management framework and policies, 3. Risk management processes and practices	Defining how fraud risk is measured,		
3. Risk management processes and practices	Defining mandate of monthly reporting of fraud risks to risk committee		
Development Management Handbook	09/2012	Finland	Project Management Office
2. Risk management framework and policies, 3. Risk management processes and practices	Defining roles, responsibilities, management and reporting of development risks		

EXTERNAL DEMANDS (Mandatory)

Category: 1. external and internal environment, 2. Risk management framework and policies, 3. Risk management processes and practices and 4. Risk management communication and consultation	**Finding**	
2010/297 The Act on Payment Institutions	2010	Finland
1. external and internal environment, 2. Risk management framework and policies,	The Act on Payment Institutions (2010/297 19§) sets high level principle for licence that payment institutions should arrange governance and risk management of operations in a way that risks that can danger its capital adequacy or solvency are identified and avoided. Payment institution has to have governance that ensures efficient risk management, sufficient internal control governance compared to its operations and sufficient risk management systems.	

1. external and internal environment, 2. Risk management framework and policies, 3. Risk management processes and practices	In a law (e.g. 19§ and 39§) mandate is given to FSA to further regulate arrangement of internal control and risk management with FSA standards. The Decree of Payments Institutions (554/2011 14§) which set terms for licence application demands description and assurance of risk management arrangement including arrangement of risk reporting to the executive management of organization, arrangements of information security and business continuity assurance of critical services.
GENERALLY ABOUT FIN-FSA STANDARDS	Each paragraph in a standard is furnished with a particular margin note: • Norm: A reference to a current legal or regulatory provision. • Binding: A FIN-FSA regulation that is legally binding on supervised entities or other financial market participants, issued by the FIN-FSA by virtue of its regulatory power based in Finnish law. • Recommendation: FIN-FSA recommendatory guidance to supervised entities or other financial market participants. • Application guideline/example: A practical application guideline or example related to a norm, binding regulation or recommendation. A reference to a FIN-FSA standard or a particular point in the standard. See the attached example. • Justifications: An explanation of the background, purpose and objectives of a regulation or standard.
FIN- FSA Standard 4.1 Internal control arrangements	Finland
1. external and internal environment	The objective of the regulation of internal control arrangements is to ensure that: - the internal control of a supervised entity and of companies within its consolidation group is commensurate with the nature, scale and complexity of their activities - the supervised entity and companies within its consolidation group do not take such risks in their activities as could materially jeopardize the supervised entity's capital adequacy, liquidity or consolidated capital adequacy - the supervised entity's internal control methods enable detection, assessment and limitation of the risks involved in the business - the supervised entity complies with the code of conduct in its customer relations
1. external and internal environment, 2. Risk management framework and policies	Binding 5.3.1 Risk control function: The function shall maintain, develop and prepare risk management principles for approval by the board of directors and design and develop procedures for controlling risks and risk management. It shall make sure that each risk remains within confirmed limits. It shall also make sure that the procedures available for measuring each risk are appropriate and reliable. The procedures must include assessment of the impact of exceptional situations (stress tests). → Creates demand that risk information from each risk (including assessment results) should be shared down-top to RM-function,
1. external and internal environment, 2. Risk management framework and policies	Binding 5.3.1 Risk control function: In addition, the risk control function must ensure that the total effect of all material business risks on the performance of the supervised entity and its consolidation group and on the regulatory capital is reported to the board of directors. → Creates demand for risk reporting and portfolio approach to the risk information
1. external and internal environment, 2. Risk management framework and policies	Application 6.1 : The duties of the CEO and other senior management include: ensuring that the practical measures of internal control are taken developing and maintaining procedures that are based on risk management principles approved by the board of directors and through which risks are recognized, assessed and measured as well as monitored and limited; these procedures shall be documented
2. Risk management framework and policies, 3. Risk management processes and practices	Binding: 6.2 Risk management: (7) Risk management shall cover all material business risks of the supervised entity: both internal and external, both measurable and non-measurable, both risks controllable by the supervised entity and risks that cannot be controlled, ie risks that the supervised entity can only protect itself against. The supervised entity shall specify measurement methods for measurable risks and develop appropriate assessment methods for the management of non-measurable risks.

2. Risk management framework and policies, 3. Risk management processes and practices	6.4: - Justifications: One of the preconditions of effective internal control is that the board of directors, CEO and other senior management, as a basis for its decision-making, is provided with adequate and comprehensive information / The information shall be reliable, material, timely, and provided in the agreed format. - Recommendation: To ensure effective internal control, the flow of necessary information should be free upward, downward and laterally throughout the organisation. Justifications: A well-implemented organisational structure supports the upward flow of information so that the board of directors, CEO and other senior management get the information they need (on operating performance, risks, deviations, observations of effective control etc.). An appropriate downward flow of information ensures that the personnel have knowledge of policies and procedures approved by the board of directors that are necessary for executing their duties, and that they are also provided with other information needed for executing their duties. → Demand to ensure down-top and top-down information flow.
2. Risk management framework and policies, 3. Risk management processes and practices	7 justification: (1) The internal control arrangements do not involve a separate, regular obligation of reporting to FIN-FSA. Application guideline: (2) However, the supervised entities shall in their financial statements also provide regular information on arrangements for internal control and for the risk management forming an integral thereof. Application guideline (3) Detailed regulation of the contents of the information to be presented in the financial statements is provided in the section 'Accounting and financial statements' in FIN-FSA's set of regulations.

FIN-FSA Standard 4.4b Management of operational risk	Finland
3. Risk management processes and practices	Damage and events related to operational risk shall be reported to FIN-FSA according to the instructions provided in reporting standard RA4.2.
3. Risk management processes and practices	Binding: Chapter 5.2: As part of internal control there has to be regular reporting of most significant operational risks to upper management.
2. Risk management framework and policies	Binding: Chapter 5.2: Accountability and reporting relations between business units and other units participating to the management of operational risk has to be clear and comprehensive
3. Risk management processes and practices	Chapter 5.4: Risk regarding new service or product has to be assessed before proceeding to the production phase.
3. Risk management processes and practices	Chapter 5.5: The supervised entity shall regularly monitor and assess the nature of recognized operational risks, the probability of risk realizations and realization losses. In addition, proactive procedures and metrics for recognizing operational risks shall be created
3. Risk management processes and practices	Chapter 5.5: Senior management must obtain regular reports on operational risks and realizations. Institutions shall draw up the related reporting instructions. The reports shall comprise financial information, qualitative analyses, assessments of compliance with internal and external instructions as well as Information on external events and changes in the operating environment that are relevant for the institution's decision-making. The reports shall address identified problem areas. They shall provide the basis for assessing changes in the value at risk and support proactive risk management.
2. Risk management framework and policies	Chapter 5.5: Senior management shall regularly assess the timeliness, precision and appropriateness of procedures and reporting systems. The contents and level of detail of reports as well as their target group and reporting frequency shall also be assessed on a regular basis.
3. Risk management processes and practices	Chapter 6: Standard demands the supervised entity to include several areas to analyses of operational risks and so to risk information management. These are operational risks regarding: Processes, Legal risk, Staff, Continuity planning, Contingency planning, Information systems and Information security, Payment systems and payment services,
3. Risk management processes and practices	Reporting obligations referred to in this standard are laid down in Standard RA4.2 on reporting of operational risk events to the FIN-FSA.

Appendix 2 Theme Interview structure and questions

Initialization: Short description of research phenomenon and research objectives.
- Underlining objectivity of the interviewer and walk trough of interview practices

Theme 1: Introduction to the research subject:
- Areas of RIM: 1. external and internal environment, 2. Risk management framework and policies, 3. Risk management processes and practices and, 4. Risk management communication and consultation

Theme 2: Current status of risk information management
External and internal environment & management framework and policies: RM targets, responsibilities, vocabulary
- In your opinion what is the objective of risk management/ risk information management
- How you see your role in risk management

- How well you know RM responsibilities set in company documentation / What is your opinion that are we acting according to these company policies?
- How you see current risk information management/reporting supporting decision making, reviews, decision proposals, project decision etc.
- Is vital information coming through official or non-official channels (which are most important?)
- Have you been asked for feedback about RM process?
- Have you received orientation or training to RM in your role?
-

Processes and practices:
- operational risk management process
- tools (risk registers) and methods workshops, risk evaluation scales, risk decision making, decision and escalation levels, monitoring of mitigation
- Incident reporting and follow up
- Project / development risk process
- Strategic risk management process (to relevant interviewees)
- Do you think that we are collecting information regarding right areas?

- What do you think that are your main sources of RIM? (Discussion about those)
-

Communication and consultation:
- Current risk management KPI's (reporting) (operational risk summaries, incident reporting) Do you think that you have clear enough risk view about your responsibility area.
- Communication and risk information sharing (e.g. between business and ICT, business and RM unit, internally inside business, compliance information)

Culture/RM awareness
- Commitment of management to RM? (your manager and you as a manager?)

- A. What you see as good procedures and would want to retain AS-IS
- B. What you see as an area that should be developed
- C. Possible procedures that you currently don't see as supporting business development and success

Theme 3: Prioritization of risk information management development
- What you see to be main development areas
- Do you recognize new methods that could support working in your role?
- Something else that you would want to rise up from the area under discussion